WESTERN GAS

August
1926

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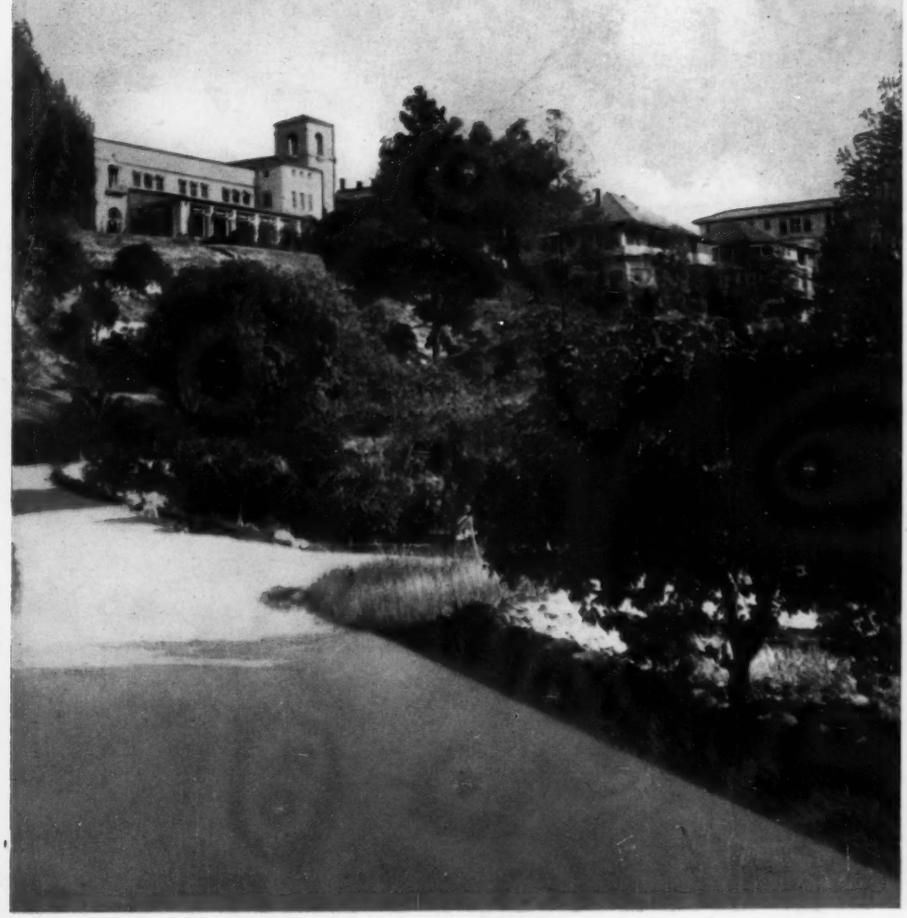
Pacific Coast Gas Association Pre-Convention Number

Pasadena, California • • August 23-27



1926 Convention Headquarters—The beautiful Vista del Arroyo Hotel and Bungalows, Pasadena, Cal., where sessions will be held during Convention dates: Aug. 23-27 inclusive

A MONTHLY JOURNAL DEVOTED TO THE WESTERN GAS & APPLIANCE INDUSTRIES

Always Tight! Easy to Turn!

Valve leakage on your high pressure or low pressure gas, can be eliminated by using

MERCO-NORDSTROM Plug Valves

Scientifically designed with flow lines offering a minimum of resistance. They open or close fully by one quarter of a turn and won't stick because they can be lubricated while under pressure.

Notice the illustration—that shows how the lubricant under pressure of the lubricating screw, flows through ducts to the bottom of the plug forcing it upward slightly to allow an unbroken film of lubricant to enter and spread over the entire seating surface. The plug is entirely enclosed in the valve body. There is no projecting nut to loosen or give trouble. No adjustment is needed to seat or unseat the plug.

An anti-friction metal washer and asbestos packing hold the plug in its seat at all times.

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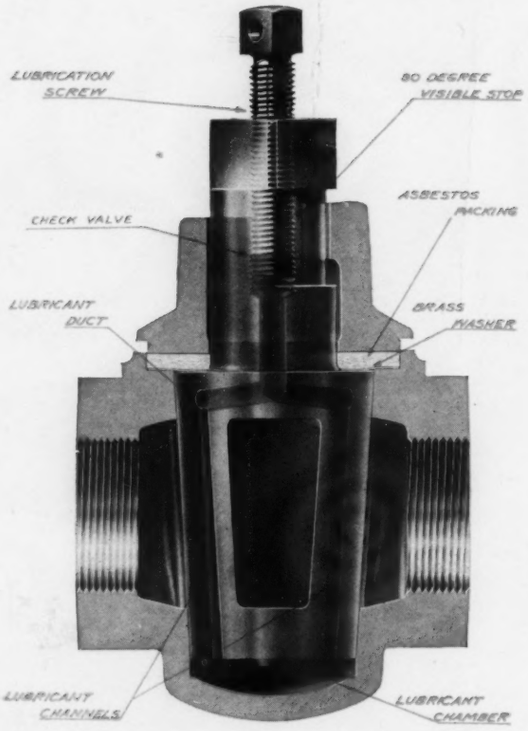


Merco Nordstrom Plug Valves will effect a decided saving in maintenance over other types of valves.

Learn more about them. All sizes, for any specified service and pressure are available.

MERCO NORDSTROM VALVE COMPANY

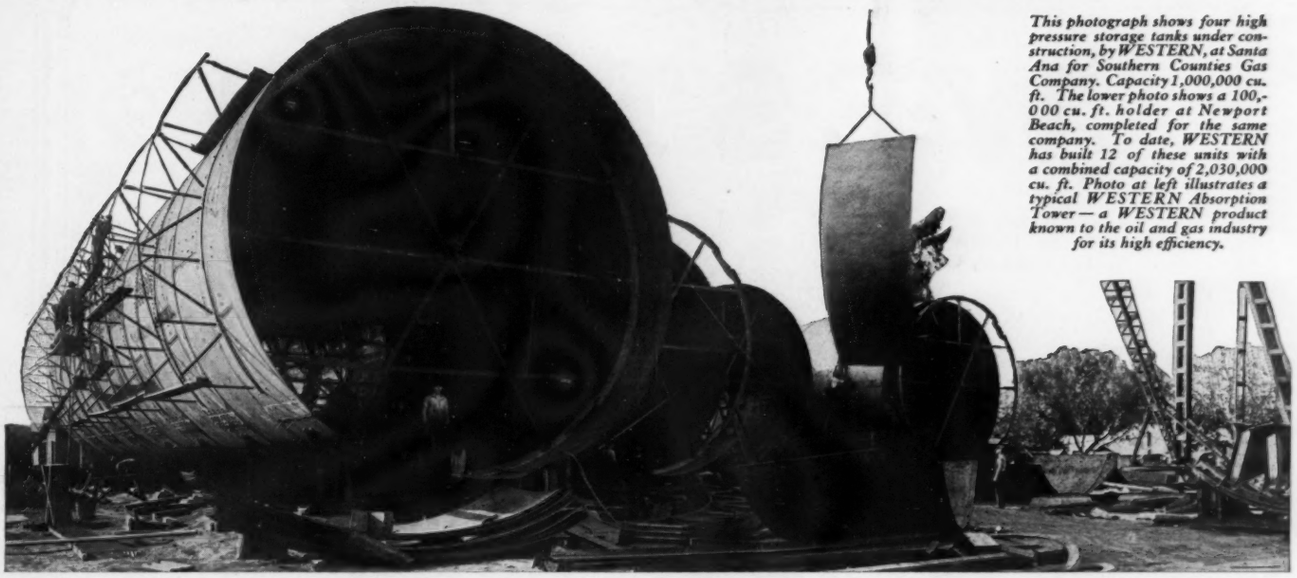
SUBSIDIARY OF THE MERRILL COMPANY

Engineers— MERCO *Manufacturers*

San Francisco, 121 Second Street
New York, 110 W. 40th Street
Chicago, Peoples Gas Building
Houston, 613 Washington Avenue
Cleveland, 325 Engineers Building
Agencies in Principal Cities

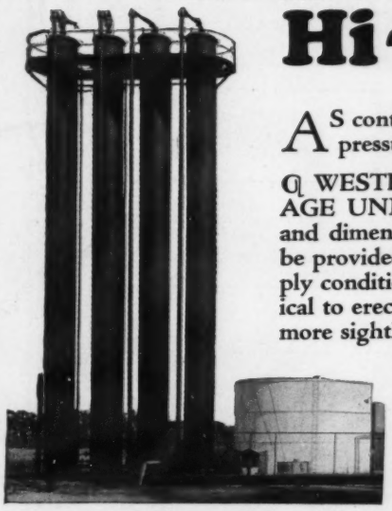
Merco Nordstrom PLUG VALVES

IN THE WEST ☙ IT'S "WESTERN"



This photograph shows four high pressure storage tanks under construction, by WESTERN, at Santa Ana for Southern Counties Gas Company. Capacity 1,000,000 cu. ft. The lower photo shows a 100,000 cu. ft. holder at Newport Beach, completed for the same company. To date, WESTERN has built 12 of these units with a combined capacity of 2,030,000 cu. ft. Photo at left illustrates a typical WESTERN Absorption Tower — a WESTERN product known to the oil and gas industry for its high efficiency.

Many advantages in WESTERN Hi-Pressure Gas Units



AS contrasted with low pressure... high pressure has many advantages.

¶ WESTERN HORIZONTAL STORAGE UNITS can be erected to any size and dimensions desired, and can quickly be provided when and where load and supply conditions dictate. They are economical to erect and in appearance are much more sightly than the usual type of holder.

¶ There are no moving parts, action is automatic and noise and odor are eliminated. Natural gas is not required as fuel for operation. Service is greatly improved.

¶ Every member of the gas industry should know more about Horizontal High Pressure Gas Holders . . . a product pioneered by WESTERN.

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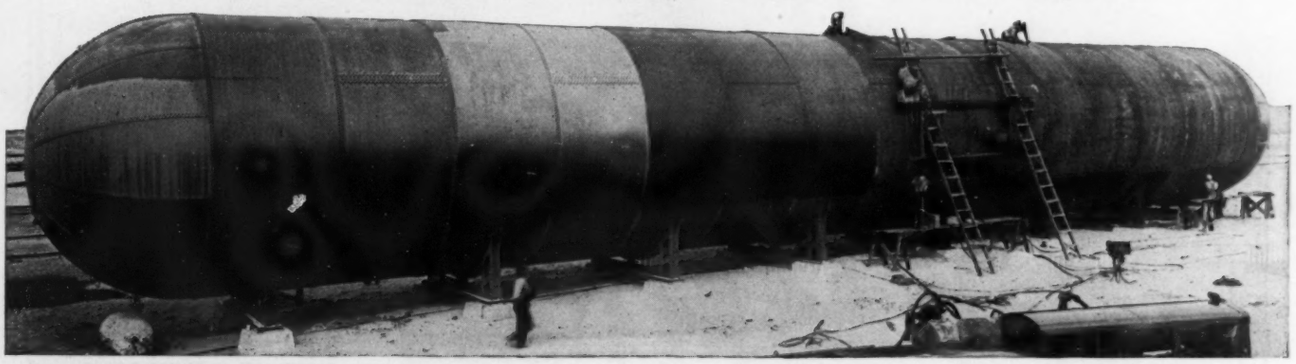

WESTERN GAS

626 S. Spring Street,
Phone TUcker 8982
Los Angeles, Calif.

447 Sutter Street
Phone GArfield 2772
San Francisco, Calif.

Official Publication Of The
Pacific Coast Gas Association

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An Invitation to Visiting Gas Men

You are cordially invited to visit us during your convention at Pasadena. The plant is located in Alhambra, only a short distance—about three miles—from convention headquarters.

C. F. Braun & Co.

Manufacturing Mechanical Engineers

Tulsa Alhambra, Calif. Dallas

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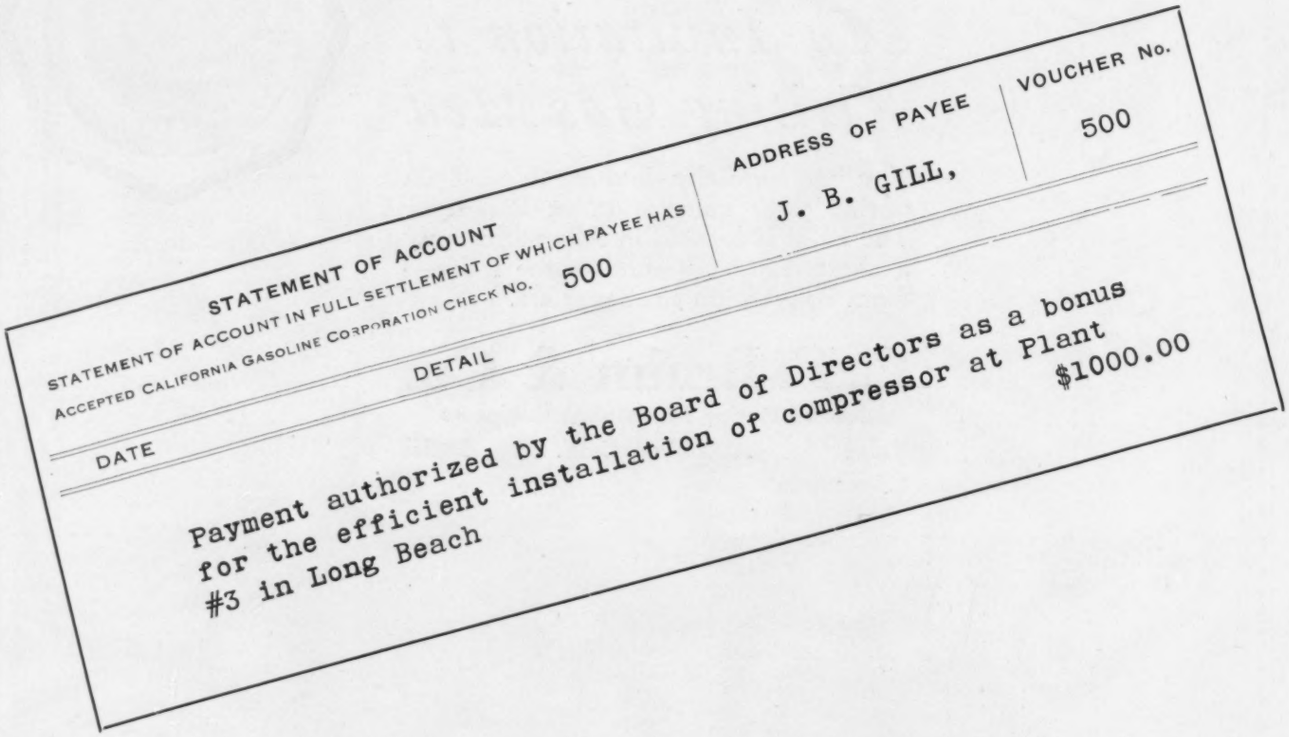

STATEMENT OF ACCOUNT

STATEMENT OF ACCOUNT IN FULL SETTLEMENT OF WHICH PAYEE HAS ACCEPTED CALIFORNIA GASOLINE CORPORATION CHECK NO. 500

ADDRESS OF PAYEE

J. B. GILL,

VOUCHER No.

500

DATE

DETAIL

Payment authorized by the Board of Directors as a bonus for the efficient installation of compressor at Plant #3 in Long Beach

$1000.00

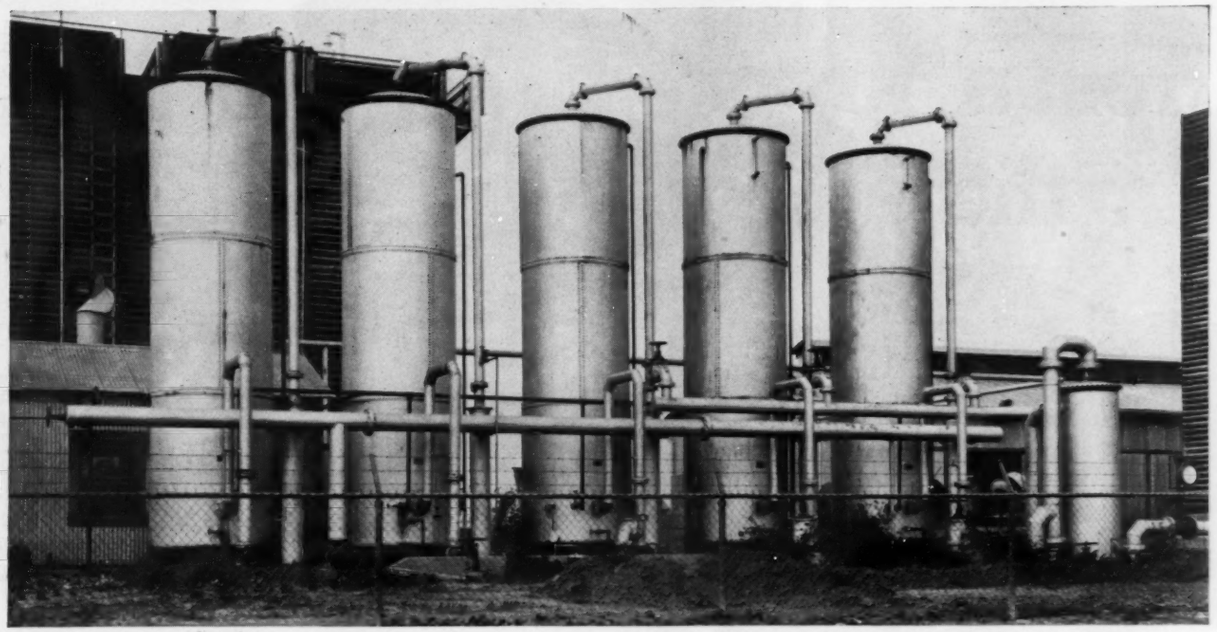
J. B. GILL CORPORATION

NATURAL GAS ENGINEERS

COMPRESSOR PLANT DESIGN AND CONSTRUCTION

P. O. BOX 669

LONG BEACH - - - CALIFORNIA



A Five-Tower Campbell Installation

Now Producing 1/3 of California's Natural Gasoline

Although Campbell Absorbers were placed upon the market less than one year ago, one-third of the production from natural gas in the entire State of California is obtained through these Absorbers. 75% of the entire natural gasoline in Long Beach is produced with Campbell Absorbers and 35% of all such gasoline in Southern California.

With this record it behooves every plant engineer to fully investigate Campbell Absorbers. Ask for data.

J. A. Campbell

Consulting—Designing—Constructing
Natural Gas Engineer

P. O. Box 669 **Long Beach, Calif.**

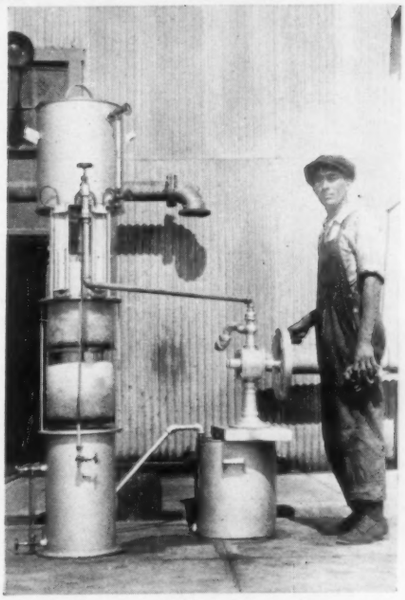


Photo of miniature Campbell Demonstration Absorber consisting of two perforated plates and glass cylinder, making froth action visible. Demonstration can be arranged at any time to suit your convenience.

CAMPBELL OIL FROTH absorber

From a 3 room cottage *to* the largest building

An Ideal Gas Boiler for every heating need

No building is too large or too small to be heated by an Ideal Gas Boiler.

For the modest cottage, there is the compact Arcola Gas Heater which can be installed upstairs as well as in the basement.

For other small homes and larger residences, the Ideal Type O-G or 1-G.

For great buildings, the Ideal Type 4-G—a gas boiler especially designed for such installations.

Here is a range of boiler capacity—from 225 sq. ft. to 8,000 steam; and from 375 sq. ft. to 13,000 water.

Ideal Gas Boilers are tested and rated according to the code of the American Gas Association. Approved by the laboratories of the country's leading gas companies, their record of past performance assures you of satisfactory service.

LET US help you sell gas house-heating. Many gas companies are using the sales helps offered in our Advertising Campaign Plan Book to increase their house-heating load. Clip out and mail the coupon today. It incurs no obligation.

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SAMUEL CLEGG

Inventor of the Gas Meter

Clegg's Mystery Box!

THE year 1815 was an important one both in war and peace. On June 18th of that year the Battle of Waterloo was fought and Napoleon's mighty empire passed into history, marking the end of that colorful period of a little more than a century ago.

On December 9th of the same year the Gas Meter, known as the "cash register of the gas industry," was invented. Samuel Clegg, a pupil of Wm. Murdock, the originator of gas lighting, was its inventor.

Up to Clegg's time gas, then winning first recognition as a lighting fuel, had been sold on an hourly basis. The result was that few or none of the early companies were financially sound.

The management of the Chartered Gas Light Company conceived the idea of measuring the gas sold instead of guessing at it. Samuel Clegg, its engineer, who had schooled himself in gas engineering under the masterful eye of Wm. Murdock, undertook the development of a gas measuring device.

In 1815, following more than two years of experimental work, Clegg brought out the first Gas Meter. A crude affair it was, indeed, but it solved the question of accurate gas measurement.

Although no small volume of water has passed under London Bridge since Clegg first gave the world his primitive gas meter, and despite the fact that many improvements have been made on its general design, still the Clegg principle has remained the same.

And now what to do with "Clegg's Mystery Box," as it was commonly called by the superstitious consumers of the time, became a serious problem.

Mr. and Mrs. John Bull of 1815 would have no "Mystery Box" on their premises. It was too difficult to understand, and besides, they argued, it permitted "too much jugglery!"

Come to the 1926 P. C. Gas Convention at Pasadena, Aug. 23-27. We invite your inspection of our Los Angeles building during the Convention Week.

Pacific Meter Works

of the
American Meter Company, Inc.
Northwestern Representative

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2118 Atlantic St.

A Message of

ECONOMY and EFFICIENCY

From the Southern Counties Gas Company *(of California)*

Read the convincing testimony given by Mr. Franklin H. Bivens, General Agent of the Southern Counties Gas Company regarding their experience and results with the

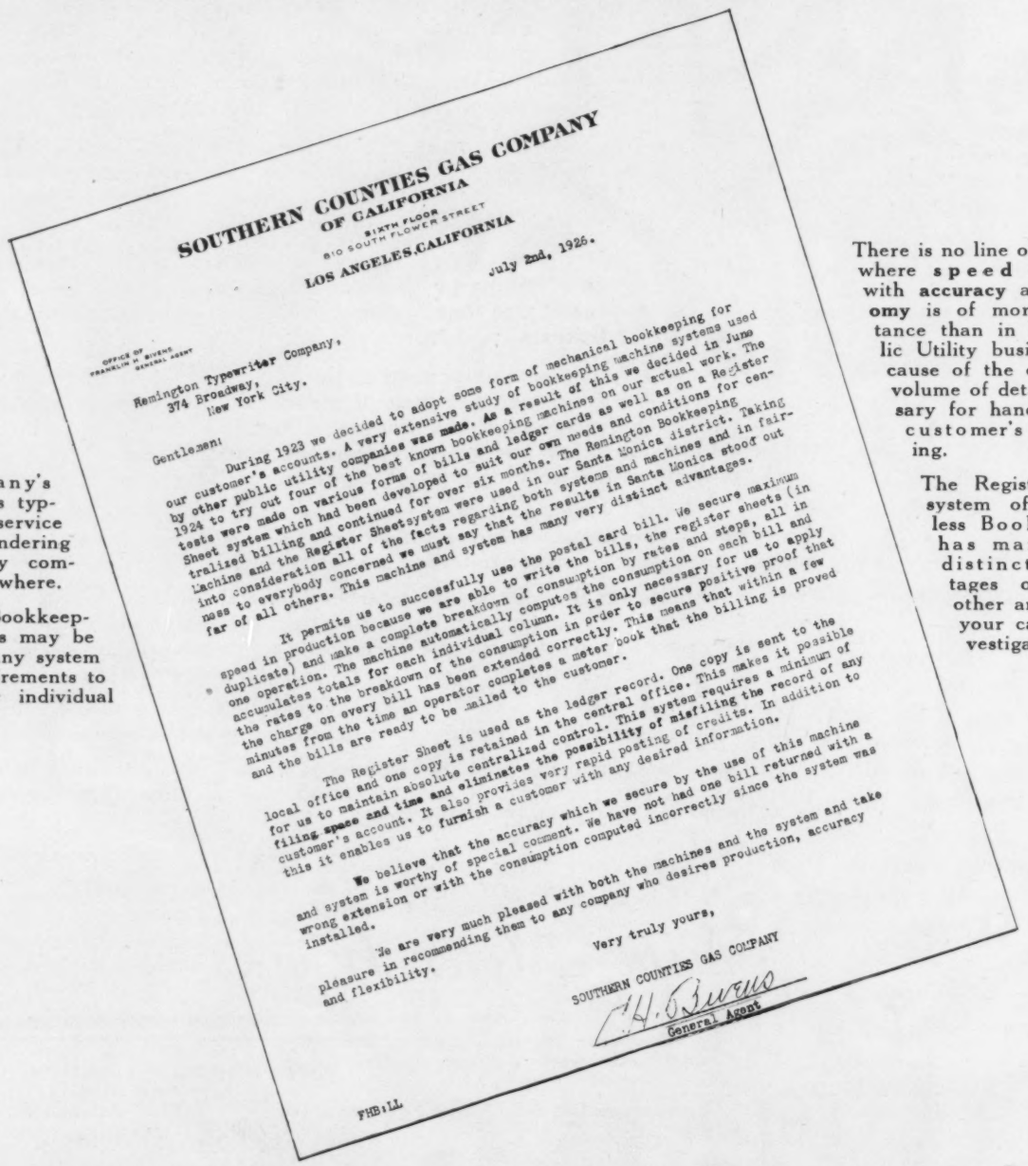
REMINGTON

(Public Utility)

BOOKKEEPING MACHINE

This company's experience is typical of the service we are rendering public utility companies everywhere.

Remington Bookkeeping Machines may be adapted to any system or any requirements to meet your individual needs.



SOUTHERN COUNTIES GAS COMPANY
OF CALIFORNIA
SIXTH FLOOR
810 SOUTH FLOWER STREET
LOS ANGELES, CALIFORNIA

July 2nd, 1926.

OFFICE OF FRANKLIN H. BIVENS GENERAL AGENT

Remington Typewriter Company,
374 Broadway,
New York City.

Gentlemen:

During 1923 we decided to adopt some form of mechanical bookkeeping for our customer's accounts. A very extensive study of bookkeeping machine systems used by other public utility companies was made. As a result of this we decided in June 1924 to try out four of the best known bookkeeping machines on our actual work. The tests were made on various forms of bills and ledger cards as well as on a Register Sheet system which had been developed to suit our own needs and conditions for centralized billing and continued for over six months. The Remington Bookkeeping Machine and the Register Sheetsystem were used in our Santa Monica district. Taking into consideration all of the facts regarding both systems and machines and in fairness to everybody concerned we must say that the results in Santa Monica stoor out far of all others. This machine and system has many very distinct advantages.

It permits us to successfully use the postal card bill. We secure maximum speed in production because we are able to write the postal card bill. We secure maximum one operation. The machine automatically computes the consumption by rates and steps, all in accumulates totals for each individual column. It is only necessary for us to apply the rates to the breakdown of the consumption in order to secure positive proof that the charge on every bill has been extended correctly. This means that within a few minutes from the time an operator completes a meter book that the billing is proved and the bills are ready to be mailed to the customer.

The Register Sheet is used as the ledger record. One copy is sent to the local office and one copy is retained in the central office. This makes it possible for us to maintain absolute centralized control. This system requires a minimum of filing space and time and eliminates the possibility of misfiling the record of any customer's account. It also provides very rapid posting of credits. In addition to this it enables us to furnish a customer with any desired information.

We believe that the accuracy which we secure by the use of this machine and system is worthy of special comment. We have not had one bill returned with a wrong extension or with the consumption computed incorrectly since the system was installed.

We are very much pleased with both the machines and the system and take pleasure in recommending them to any company who desires production, accuracy and flexibility.

Very truly yours,

SOUTHERN COUNTIES GAS COMPANY

F.H. Bivens
General Agent

FHB:LL

There is no line of business where **speed** combined with **accuracy** and **economy** is of more importance than in the Public Utility business, because of the enormous volume of detail necessary for handling the customer's accounting.

The Register Sheet system of Ledgerless Bookkeeping has many very distinct advantages over any other and merits your careful investigation.

Mr. Bivens extends a very cordial invitation to any delegates attending the convention of the Pacific Coast Gas Association who care to see this system in actual operation to call at their Monrovia Office, which is only a few miles east of Pasadena.

We will be glad to have our representative call at your office and discuss the application of this machine to your individual requirements without any obligation on your part.

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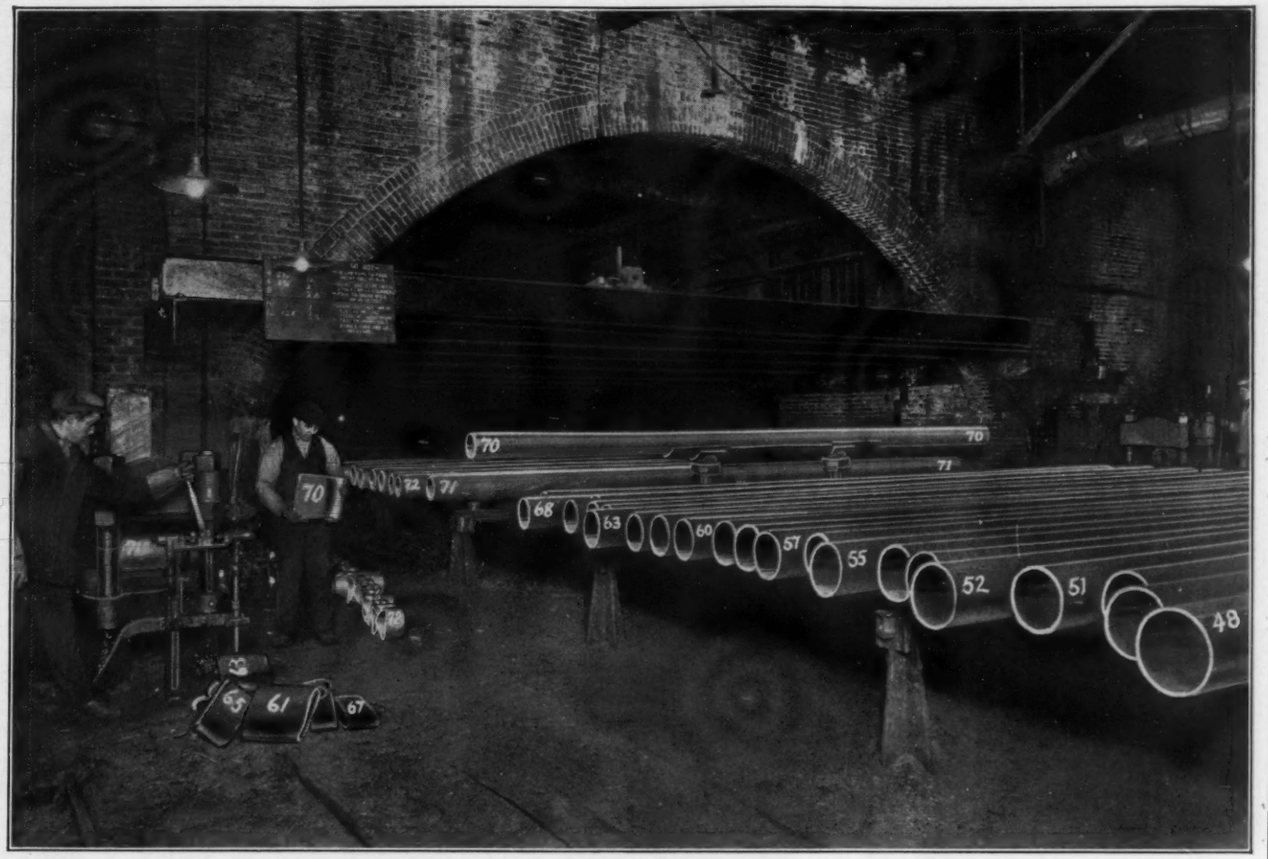
374 Broadway, New York City—Branches Everywhere



The Same Test That Railroads Use in Buying Rails

Every length of Chester Pipe must pass the Crop-End Test. Both crop ends are crushed and examined as an additional important physical test to check the character of weld and metal of each length of pipe.

By the system of duplicate numbers on pipe and crop-ends, identity is immediately established. Rejects are returned to the mill on the Return Runway.

The usual method of testing and checking heavy duty material is to take a small percentage of the number of pieces for test purposes. South Chester Tube Company goes to the extreme of making two tests of each piece which represents a 200% check.

This is but one of the means Chester employs to insure 100% satisfaction in its product. The wide use of Chester Pipe is evidence that this care is appreciated.

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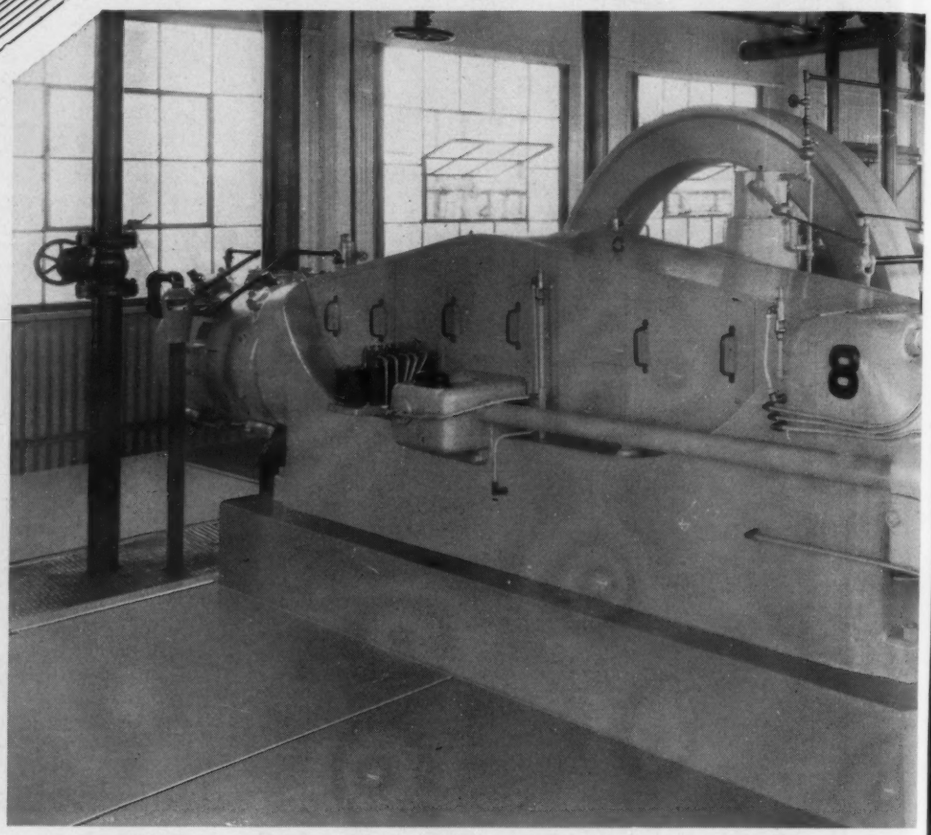

The Gasoline Production at

Choose Your Compressors on

This plant of eleven Type-80 Cooper compressors is making several thousands more gallons of gasoline per month than was expected. This is partly due to the compressors pumping more gas for so much nearer 100% of the time than was calculated.

Cooper four-cycle gas engines operate with an exceptionally low fuel consumption—hence the income from the sale of residue gas is greater than was anticipated.

The power cylinders have abundant water cooling space,

THE C. & G. COOPER CO.,

Kirby Bldg., Dallas **317 Bank of Italy**

ENGINES

this Plant Tells the Story

the Basis of Gasoline Produced

hence they operate cooler. This, with the Cooper method of scientific lubrication, has made the lubricating oil consumption lower than was expected.

The maintenance expense is almost negligible. The result is a higher production of gasoline at a lower cost. If you are choosing your compressor equipment on this basis, you will sooner or later use Cooper engines direct driving Cooper compressors.

Cooper engines and compressors are stocked in California and are sold and serviced direct by the company building them.

MOUNT VERNON, OHIO

Building, Los Angeles **Kennedy Bldg., Tulsa**

Mettler
Low Pressure Gas Burners
Guaranteed

To produce the highest economy possible to obtain from combustion of either NATURAL or MANUFACTURED GAS.

Workmanship and material absolutely first class in every respect.

These Burners are built on the MULTI-UNIT MULTI-JET principle which insures very thorough mixing of Gas and Air.

Produces complete combustion close to the end of the burner with a minimum amount of excess air and eliminates furnace and boiler repairs caused by the blow-torch effect of high pressure burners.

Gas Companies will reduce leakage and friction loss by using low pressure in mains.

Over 300,000 Boiler H. P. now equipped with

Mettler Gas Burners

There's a Reason!

Mettler Entrained Combustion Gas Burners

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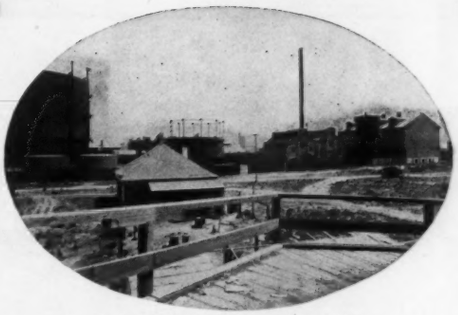
406 S. Main St. Los Angeles Cal.



Los Angeles Plant—1910

Los Angeles Plant—1926

(A second complete manufacturing plant is maintained in Colton for the San Bernardino Valley.)

Sixteen Years---

IN sixteen years the Southern California Gas Company added 170,000 customers to their lines, laid over 2,600 miles of main, and grew to have a capital investment of over thirty million dollars.

The gas send-out in 1925 was almost forty-four thousand million cubic feet. They now serve seventy cities, towns, and communities.

Southern California Gas Company

SOUTHERN CALIFORNIA GAS COMPANY
DEPENDABLE SERVICE
GAS
★ ★ ★

Don't Store Lampblack

Cut shows Stirling Boilers installed at the Protrero Plant of the Pacific Gas and Electric Company. Similar installations are in use at Oakland, Fresno, Sacramento, San Jose, Marysville and Vallejo.

Stirling double end fired boilers enable you to burn all of your lampblack, effecting double economies in operation costs. You are able to use all your fuel—and use it as it is made.

The Babcock & Wilcox Company

B. & W. and Stirling Boilers

CHAS. C. MOORE, Pacific Coast Manager

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This $350 Machine will Raise Your Pipe Inventories

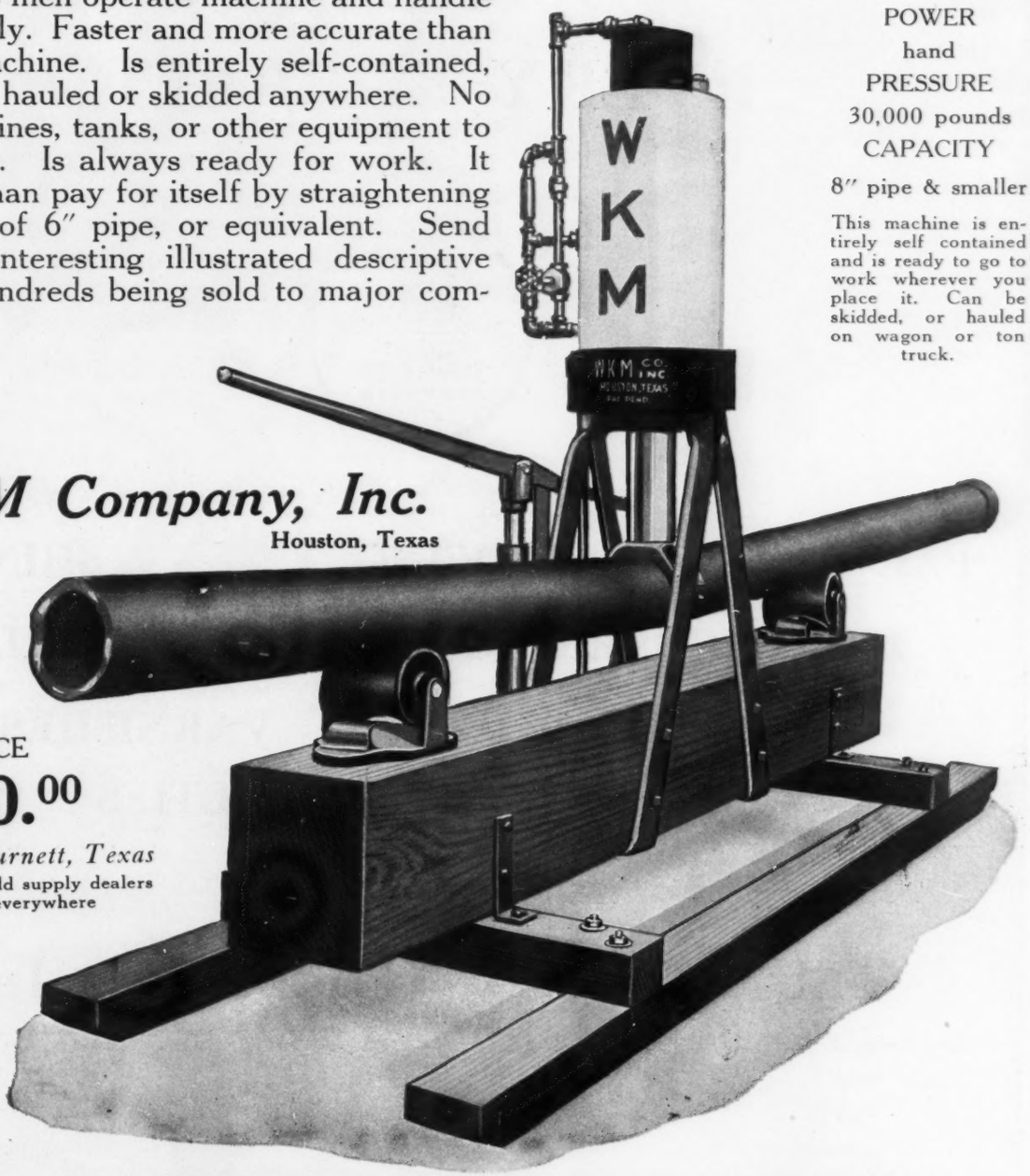
many thousands of dollars!

Operated by the least expensive kind of manual labor, this remarkable Hydraulic machine will very quickly raise your pipe inventories thousands of dollars by straightening all of your bent material in sizes from 1″ to 8″. Two men operate machine and handle pipe perfectly. Faster and more accurate than a power machine. Is entirely self-contained, and may be hauled or skidded anywhere. No pumps, oil lines, tanks, or other equipment to bother with. Is always ready for work. It will more than pay for itself by straightening fifty joints of 6″ pipe, or equivalent. Send today for interesting illustrated descriptive folder. Hundreds being sold to major companies.

Our Pacific Coast representative, J. W. McMillan, Box 129, Torrance, will gladly discuss this with you. His phone is Torrance 235.

WEIGHT
1275 pounds
POWER
hand
PRESSURE
30,000 pounds
CAPACITY
8″ pipe & smaller

This machine is entirely self contained and is ready to go to work wherever you place it. Can be skidded, or hauled on wagon or ton truck.



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West Building **Houston, Texas**

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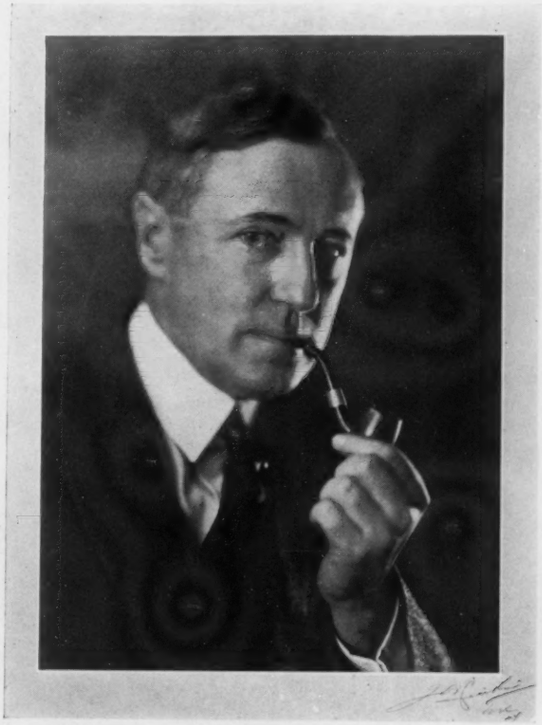


A Word *of* Tribute

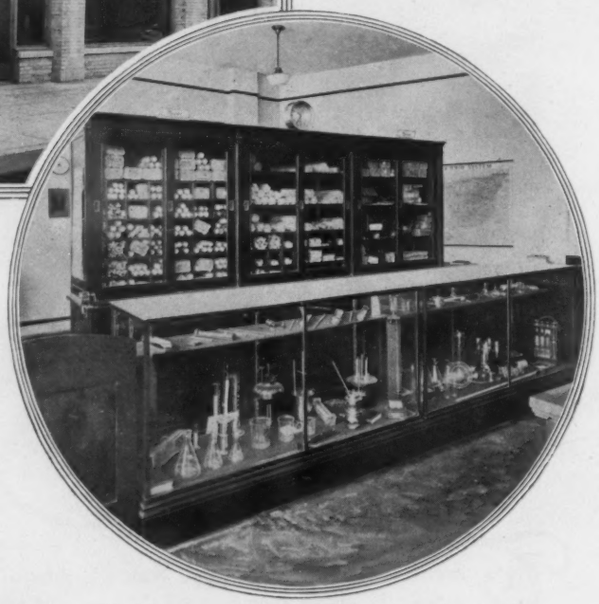
TO the late Henry P. Westcott, well known and held in high esteem by many members of the Industry, is due much credit for the perfection and availability of certain specialized apparatus in common use by Gas men of today. His unfailing energy and enthusiasm were ever directed toward the development and standardization of measurement and control instruments to meet the specific needs of the gas industry, an endeavor for which he was well fitted by his long experience in almost every branch of the industry.

As a direct result of his efforts, many highly developed instruments have been put into the hands of the gas technical man, notable among them the orifice meter.

Not satisfied with the mere improvement of this specialized equipment from a technical standpoint, Mr. Westcott conceived and organized a sales and service headquarters. Here he assembled a staff of trained men to supervise sales and render technical service on a large number of kindred products. This organization has grown to be a veritable headquarters for the technical men of the Industry . . . .

W E S T C O T T & G R E I S , I N C .

Sales and Service



A Real Headquarters *for the* Technical Man

Almost daily, the gas technical man is called upon to analyze problems involving measurement, control, safety, and conservation. Many times he welcomes outside advice and assistance in the selection of proper instruments and the design of practical set-ups.

It is on this premise that the personnel and service policies of Westcott and Greis have been built. Our sales and service men are trained engineers, well versed in the needs of gas men generally, and particularly as regards the peculiar conditions existing in the locality they serve.

They are backed by a well-rounded-out stock of instruments and supplies, which means that the materials required for a given installation are right at hand and there is no question of delay or substitution.

The real value and utility of this complete service can be fully appreciated only by those with whom we have come into actual contact. We cordially invite you to visit our sales rooms or to make an appointment by phone elsewhere.

W E S T C O T T & G R E I S , I N C .

Sales and Service

G. H. ("Unk") Unkefer

J. O. ("Johnnie") Wiley

"Harry" Prowell

WE ARE SALES AND ENGINEERING REPRESENTATIVES FOR:

Metric Metal Works of the American Meter Company
Westcott orifice meters for gas, steam, air, and liquids; special test meters and orifice well testers.

G. M. Davis Regulator Company
Reducing and back-pressure valves for gas, steam, and liquids; liquid level controls and steam traps; stop and check valves and relief valves; pump governors and differential control valves.

Crosby Steam Gauge & Valve Company
Indicating and recording pressure gauges; relief and pop safety valves for steam, gases, and liquids; fullway and steam throttling valves; engine indicators and special testing equipment.

Taylor Instrument Company
Complete laboratory equipment for oil, gas, and gasoline trades; Tycos recording and index thermometers; engraved stem thermometers; hydrometers, temperature regulators, and pyrometers.

Meriam Company
Manometers, test meters and draft gauges; pressure gauge shock absorbers.

Laboratory Supplies
Pyrex and Resistant glassware; special oil and gas testing instruments.

Safety Appliances
Tank equipment: vents, hatchers, thief-hole devices and winches.

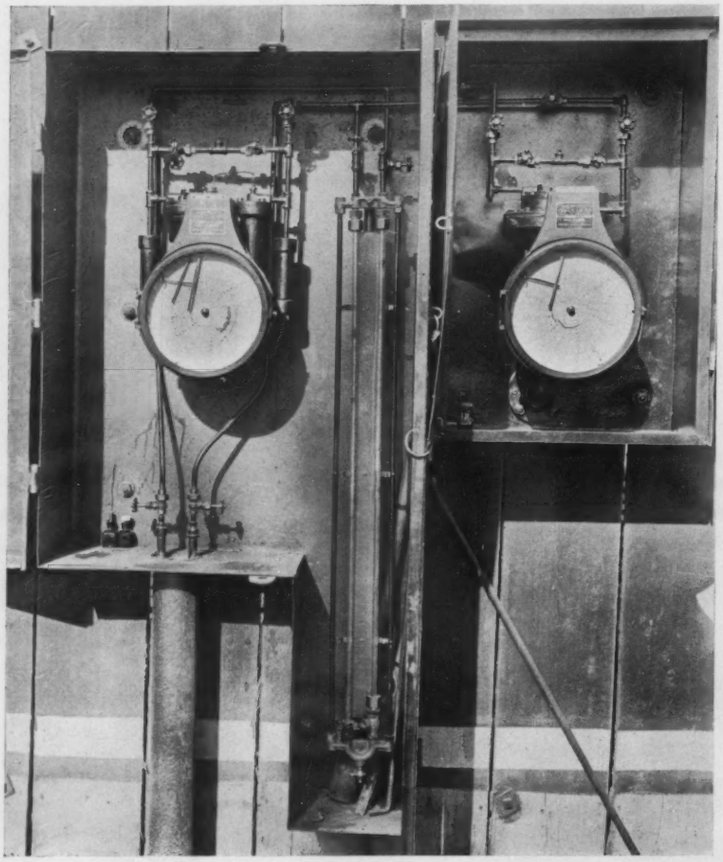
Complete stocks of lines listed are carried at our Los Angeles warehouse.

Westcott & Greis, Inc.

1945 Santa Fe Ave. Los Angeles, Calif.
Telephone TRinity 8497

W E S T C O T T & G R E I S , I N C .

Sales and Service



Combination set-up on one of the main lines into Los Angeles Gas & Electric Company's main plant. Installation comprises a 50-inch and a 10-inch Metric Orifice Meter, actually recording from 1/20 inch to 50 inches, or from 35,000 to 1,800,000 cu. ft. per hour.

METRIC ORIFICE METERS

Of the Metric Orifice Meters, Type A was the first introduced. It was given immediate recognition as the standard mercury float type differential gauge throughout oil and gas fields everywhere. Since the advent of this type, a number of additional types have been born, so that today, there is an orifice meter of Metric manufacture suitable for every phase of measurement of gas, gasoline, oil, air, steam and water.

Accuracy, Ease of Inspection, and Dependable Operation, are the three main factors provided for in Metric Meter design.

If you, Mr. Reader, have not yet experienced the measuring qualities of a Metric Meter, it is high time you allowed yourself the extra satisfaction they give. Ask operators who use Metric Meters why; or write for the Metric Meter Bulletin No. 123, which gives valuable data on the orifice type of measuring apparatus.

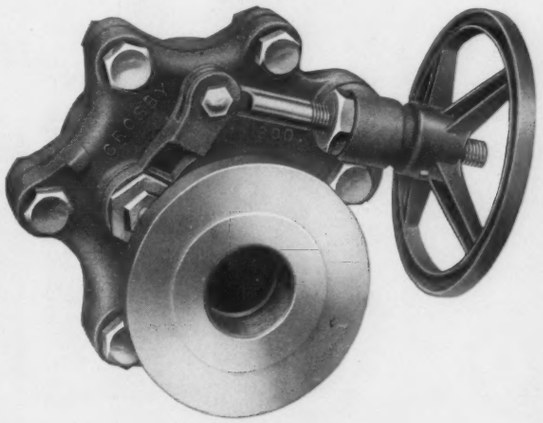
METRIC METAL WORKS
of the American Meter Company-Inc.
ERIE - PENNSYLVANIA - U-S-A

WESTCOTT & GREIS, INC.
Sales and Service

For absolutely dependable service, specify—

CROSBY

Fullway Valves



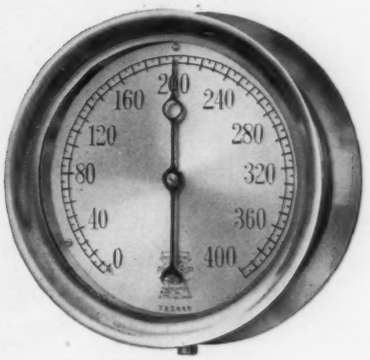
These valves are absolutely dependable for any kind of service—steam, water, oil, heavy liquids, and gas.

They are ideal for blow-offs and drips, replacing gate valves and cocks on any kind of pipe line, and blow-down service.

These Crosbys are double-disc, parallel-seating valves operating by lever or hand wheel and toggle lever, which lock the valve tight against pressure from either direction. The disc is in contact with the seat at all times, making the valve self cleaning. Crosby Fullway Valves are guaranteed to 300 lbs. working pressure, with either screwed or flanged connections.

CROSBY

Double Spring Pressure Gauges



They combine extreme sensitiveness with accurate indication. Made with one-piece double Bourdon tube springs, and the entire motion of free ends is employed to produce both vertical and horizontal component of movement. This permits heavier tubing and greatly reduces pointer vibration. Double tube springs are self-draining and cannot freeze. A geared movement is used which minimizes lost motion and friction. All parts are of bronze or German silver and are non-corrosive. Steel parts are used in ammonia gauges. Either black or white face dials can be furnished. Cases are cast iron or cast bronze composition.

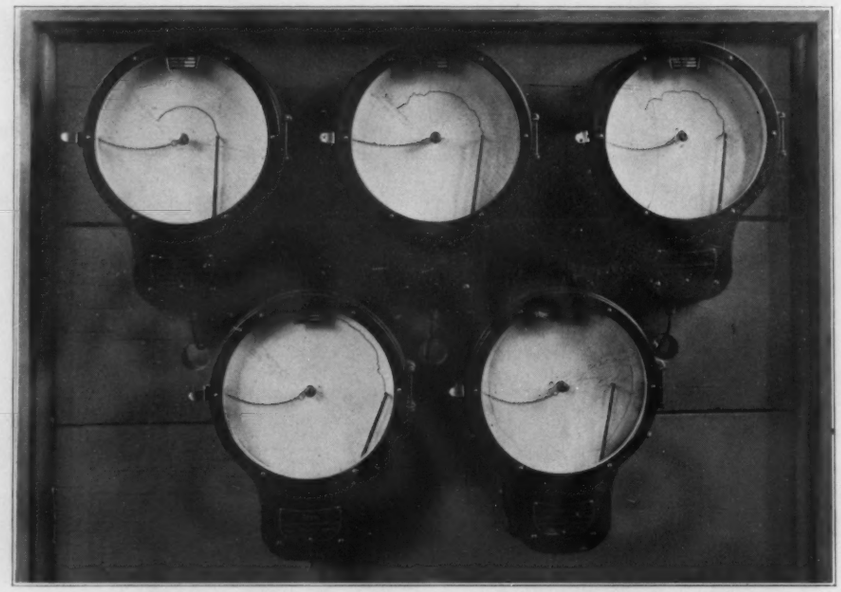
Consult us on your pressure and vacuum gauge needs. We will be pleased to recommend the most suitable gauges for all locations in your plant.

CROSBY STEAM GAUGE & VALVE CO.
Boston, Mass.

Also Manufacturers of Safety and Relief Valves, Globe Angle Valves, Engine Indicators, Recording Instruments

W E S T C O T T & G R E I S , I N C .

Sales and Service



Temperature Recording and Control Board, showing five Tycos Recording Thermometers, in the Shell Company of Calif. plant in Brea, California

RECENT develop-ment in the operation of natural gasoline plants, as well as other equipment in the gas industry, are directly traceable to the keeping of accurate operation records. Tycos temperature recording instruments have played an important part in this advance in efficiency, and today they are to be found in almost every up-to-date plant.

Tycos

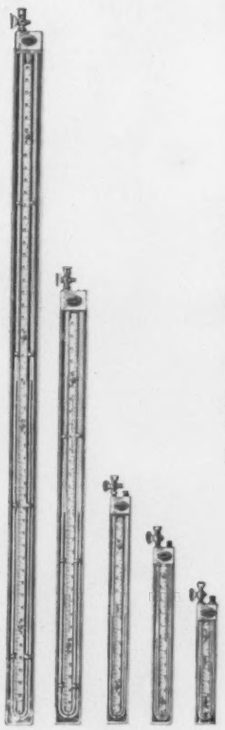
Temperature Instruments

Taylor Instrument Companies

ROCHESTER, N. Y.

W E S T C O T T & G R E I S , I N C .

Sales and Service



MERIAM

"U" Type Manometers

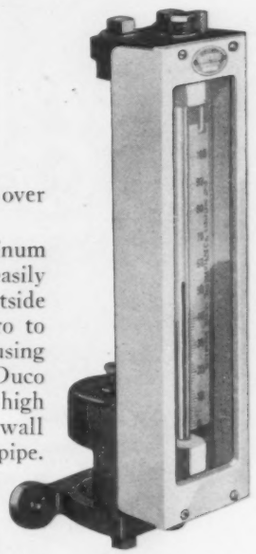
THE "U" Type Manometers are necessarily accurate and cannot be otherwise as their Indicating medium is affected only by gravity.

Meriam Manometers are durable. The body is of cast aluminum, in one piece, having projecting sides and raised centers. Within this recess is placed a "U" tube, both ends of which are securely held against cork packing in the head of the frame and sealed.

Upon the raised center is mounted an accurately graduated aluminum etched scale with black enameled figures. This scale is provided with slots near each end and is secured to the frame by means of thumb screws, allowing a quick zero setting.

In any type of business these Meriam "U" Type Manometers serve but one purpose—to give within their range a true measure of Pressure or Vacuum.

Indicating Flow Meters

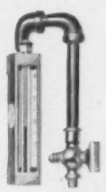


THIS Type "C," which is gland packed, can be used with working pressures up to 1000 lbs.; with Gas or Air or any liquid at any temperature.

Used where accurate knowledge of the rate of flow is necessary and for a permanent check on the accuracy of any recording meter. Fitted with safety overflow mercury chamber to prevent the accidental blowing over of mercury into the line.

The scale, made of aluminum etched with black figures, is easily read; is adjustable from the outside and graduated to read from Zero to 110 inches of water differential, using Mercury. Finished in "Duco Enamel," Type "C" is 13 in. high and may either be screwed to the wall or supported on standard 2 inch pipe.

Well Type Manometers



WHERE low pressures are to be determined and direct reading is essential, these Meriam Well Type Manometers are recommended.

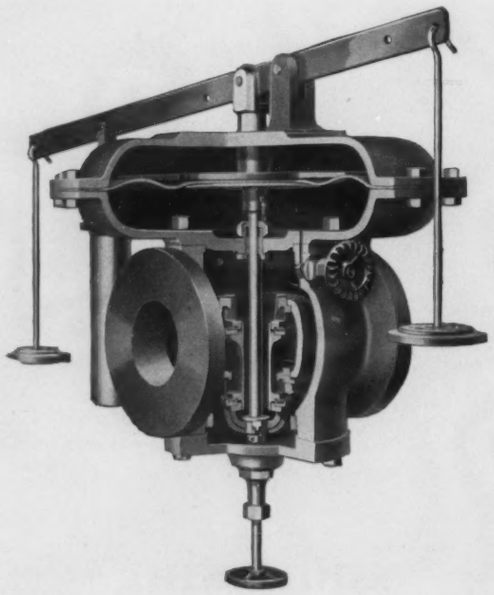
Moisture proof; mercury will not spill out; sufficiently small to be carried in the pocket.

Scale indicating in ounces up to 22 oz. will be furnished unless otherwise ordered. Scales graduated in inches and tenths indicating up to three inches, and scales graduated in inches of water, using mercury and indicating up to 40, are carried in stock.

Also Manufacturers of Draft Gauges and Shock Absorbers

W E S T C O T T & G R E I S , I N C .

Sales and Service



Davis Improved Low Pressure Automatic Gas Regulator

IMPROVEMENTS in the design of this Davis Gas Regulator produce an automatic valve that will handle large reductions in pressure accurately and dependably.

The double seated, balanced valve is especially designed to close tight, and it stays tight in service. Renewable soft discs, a seat cage removable without disturbing the valve body, and the typical Davis simplicity of design and operation are features that distinguish this regulator.

Made for reducing high pressures of up to 250 lbs. down to 5 lbs. or less, as specified.

Send for the Davis Catalog with complete description

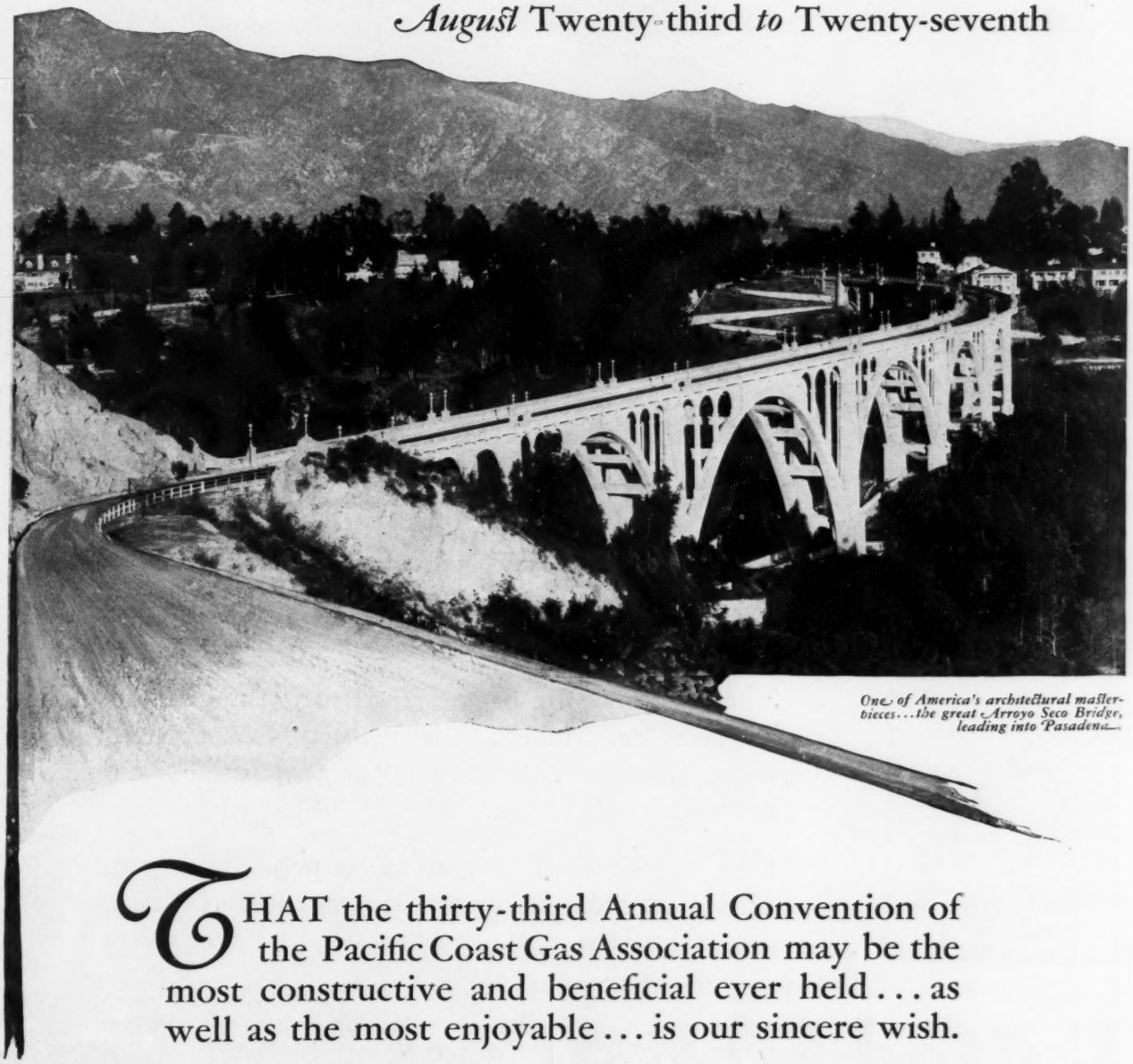
THE G. M. DAVIS REGULATOR CO.
409 Milwaukee Avenue Chicago, Illinois

Also Manufacturers of Back Pressure and Vacuum Relief Valves, Balance Valves, Float Boxes, Float Valves, Steam Traps and Steam Regulators

W E S T C O T T & G R E I S , I N C .
Sales and Service

Welcome *to* PASADENA

August Twenty-third *to* Twenty-seventh



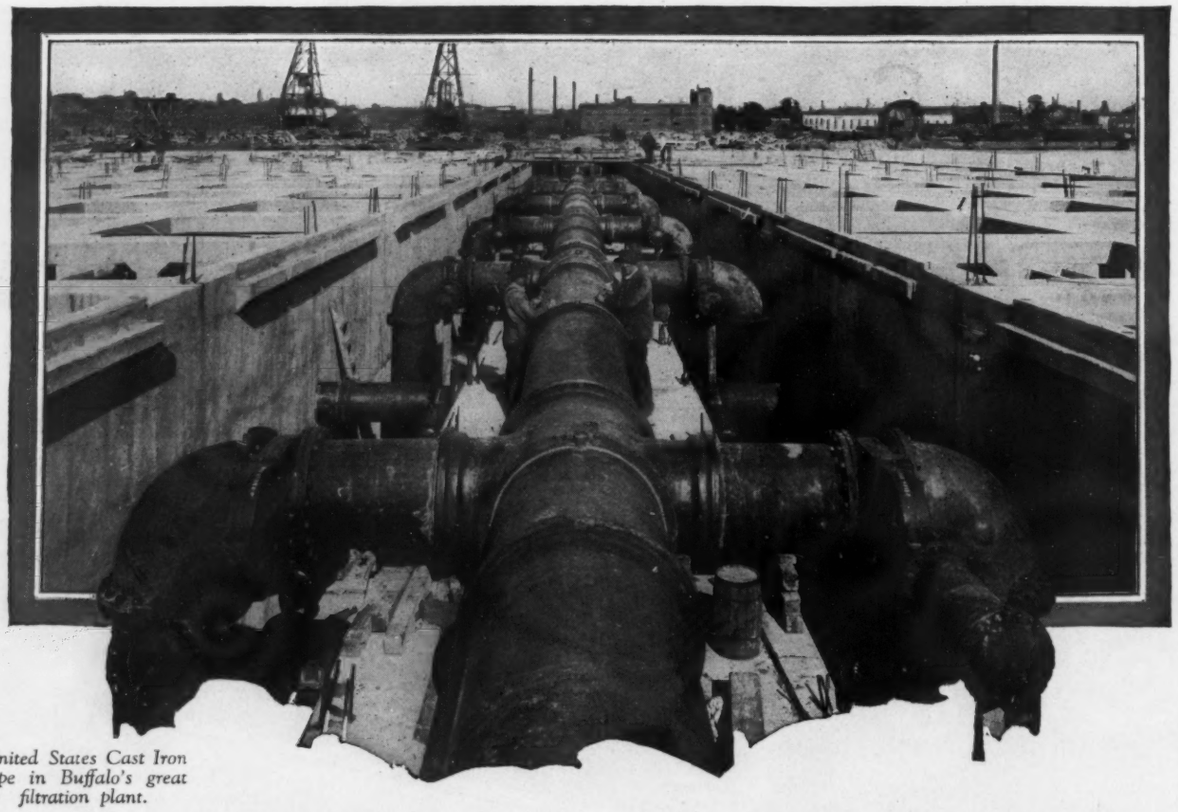
One of America's architectural masterpieces... the great Arroyo Seco Bridge, leading into Pasadena.

THAT the thirty-third Annual Convention of the Pacific Coast Gas Association may be the most constructive and beneficial ever held... as well as the most enjoyable... is our sincere wish.

RELIANCE MANUFACTURING COMPANY

PASADENA, CALIFORNIA

Manufacturers of Reliance *Regulators*



United States Cast Iron Pipe in Buffalo's great filtration plant.

Waterworks engineers prefer Cast Iron Pipe on account of its permanence

This quality is especially valuable where intricate installations are necessary such as in this great filtration plant.

The length of life of the Cast Iron Pipe has not yet been determined. The first Cast Iron Pipe in this country was laid down over a hundred years ago and is still in use.

Our engineers will be glad to cooperate with you on any problem involving pipe, castings or fittings.

United States Cast Iron Pipe and Foundry Company

SALES OFFICES

Philadelphia: 1421 Chestnut St. *New York:* 71 Broadway
Chicago: 122 So. Michigan Blvd. *San Francisco:* 3rd & Market Sts.
Birmingham: 1st Ave. & 20th St. *Pittsburgh:* 6th & Smithfield Sts.
Buffalo: 957 East Ferry Street *Dallas:* Akard & Commerce Sts.
Cleveland: 1150 East 26th Street *Kansas City:* 13th & Locust Sts.
Minneapolis: 6th St. & Hennepin Ave.

General Offices:
Burlington, New Jersey

Actual photograph from an industrial motion picture, "Making Cast Iron Pipe." This view shows the ease of handling Centrifugal Cast Iron Pipe.

deLavaud Centrifugal
costs less per foot installed

All deLavaud pipe are truly concentric and free from impurities.

This process eliminates the necessity of any allowance for irregular thicknesses.

Foot for foot this pipe costs less. It is lighter but stronger.

The self centering bell facilitates laying.

Write for United States Cast Iron Pipe handbook and refer to special paragraphs on deLavaud Centrifugal Pipe.

United States Cast Iron Pipe and Foundry Company

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Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
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New York: 71 Broadway
San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.

General Offices:
Burlington, New Jersey

GOODMAN *Improved* SAFETY GAS MAIN STOPPER

The GOODMAN STOPPER has grown up with the Gas Industry, and like the Gas Industry, improves as it grows.

The genuine GOODMAN STOPPER is instantly recognized by the name GOODMAN which appears on the Improved Patented Locking Sleeve. All genuine Goodman Stoppers are now equipped with this sleeve. Efficient as the Goodman Stopper has always been, the new locking sleeve makes the shut-off still more effective and positive. Stopper cannot slip—gas cannot pass.

All standard sizes 3″ to 48″ in stock.
Special sizes to order on short notice.

Dependable Gas Main Bags

BUILT IN THREE TYPES

TYPE A—Invisible Seams or Seamless Bag.
TYPE B—Reinforced Seams—heavier and stronger than Type A.
TYPE C—Canvas Covered Bags for use in Mains coated with Tar or Oil. This Bag is different from any other because the lining is loose inside the canvas while the canvas cover itself is fitted snugly to the tube and neck of the bag, allowing the pressure to pass on to the canvas cover, the lining itself being used only as a seal. Rugged, durable, and built for wear, the inner bag is partially protected against the effects of tar or gas liquor.

When ordering, specify type desired

Street Department Supplies

Brushes (Pipe Cleaning) **Yarn**

Gloves-Mittens **Packings**

Asbestos Lead Joint Runners

Asbestos **Soap Tape**

Canvas **Binding Tape**

Rubber

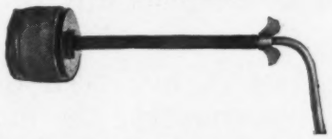
All Goods Sent on Approval

SAFETY SERVICE PLUGS

Type "A"
Expansion Plug which fits into the bottom of the service tee and is quickly expanded by turning the wing nut which securely shuts off all gas. Size ¾" to 4".

Type "B"
One piece Rubber Plug, taper shaped, can be quickly applied to the bottom of service tee. Fits wedge like and prevents gas escaping. Sizes ¾" to 4".

EXPANSION PLUGS FOR GAS MAINS



Fits inside diameter of pipe. Long shank reaches inside past the hub. Can be used in either hub or spigot ends. Standard sizes to 16".

SOFT WOOD PLUGS

Type C
Made from one piece number one white wood. Sizes 3" to 8".

Type D
Made from number one white wood. Pieces are properly glued together. Will not crack or split. Eyebolt and ring facilitates handling. Sizes 10" to 48".

AIR LINE MASK

With or Without Blower

"U" GAUGES

Portable Pressure Gauge for Distribution Men, Complaint Men, or around the Works.

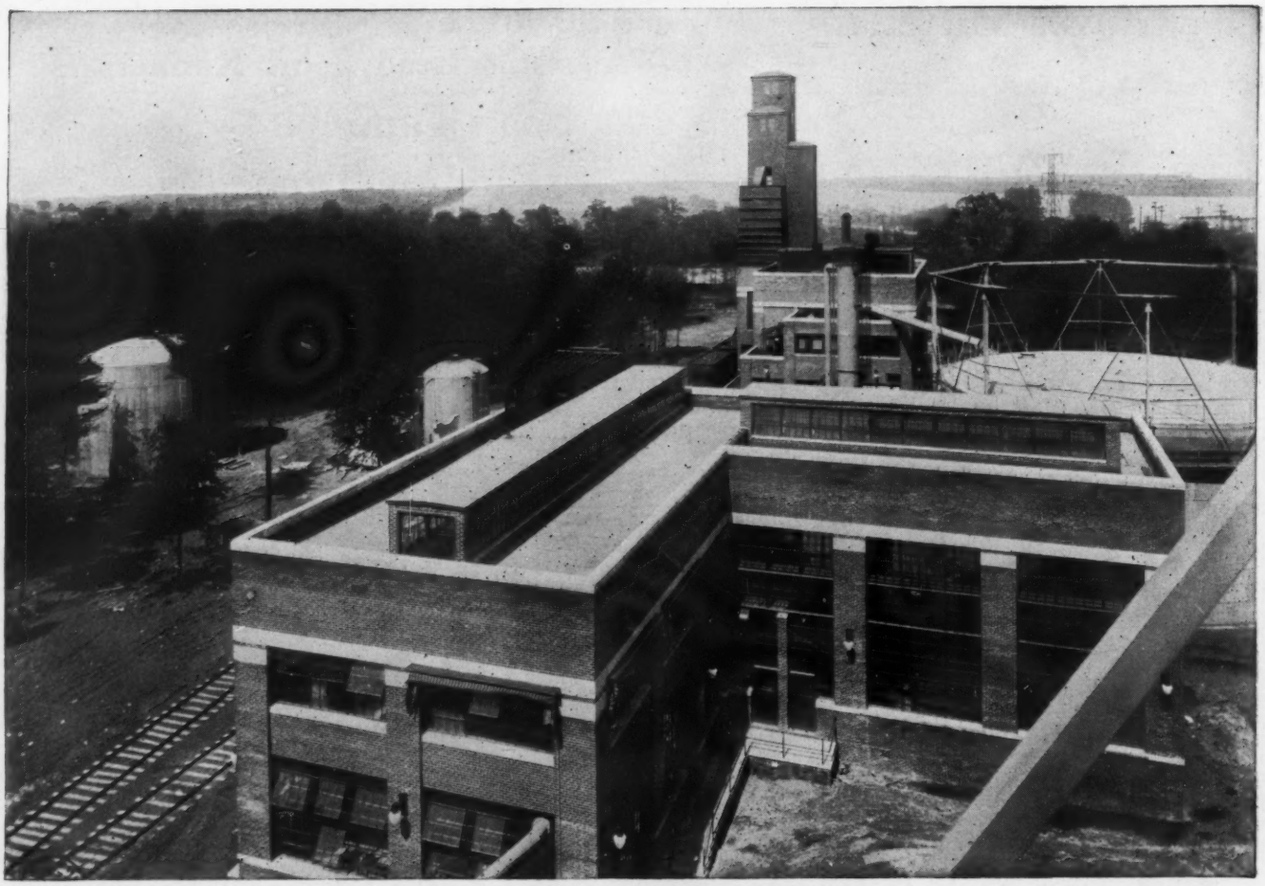
SAFETY GAS MAIN STOPPER CO.

Pacific Coast Representative: C. B. BABCOCK CO., San Francisco

Cable Address: GASTOPPER, N. Y.

523 Atlantic Ave. **Brooklyn, N. Y.**

The Most Beautiful Gas Plant In America



Marysville Gas Plant, Marysville, Michigan, built for The Detroit Edison Company, Port Huron, Michigan

A gas plant can be just as attractive and kept as clean as any other industrial plant.

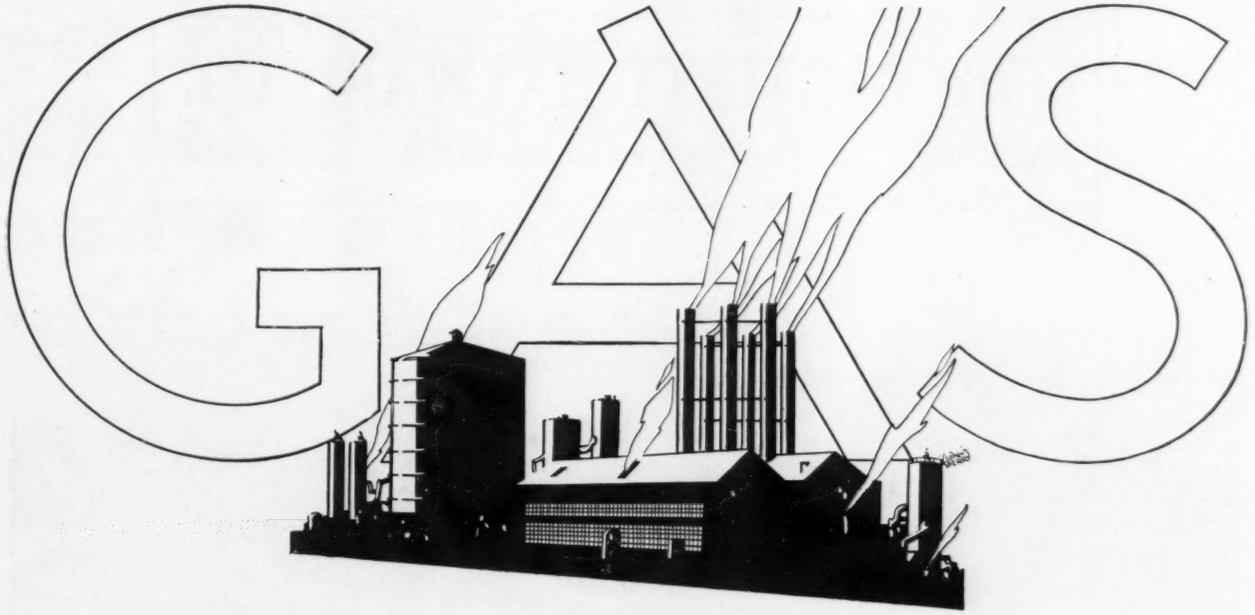
This plant is not only attractive in appearance, but it has been pronounced by prominent gas engineers from every part of the country, the most complete, up-to-date, and in every way modern installation of its kind ever built.

This plant, with its Water Gas equipment, illustrates Steere design, engineering and manufacturing facilities.

We Know We Can Save You Money

STEERE
ENGINEERING CO.
DETROIT, MICHIGAN

"A BUSINESS BUILT ON SERVICE"



IT has been our privilege to watch the Pacific Coast Gas Industry make wonderful progress in recent years. Today, it is a great economic force. Much of this will be reflected in the Association's Convention at Pasadena, August 23rd to 27th. ¶ It has also been our pleasure to furnish members of the industry WESTCOTT and FAIRBANKS Valves, and pipe and pipe fittings —a privilege we value most highly.

THE

REPUBLIC

SUPPLY COMPANY

OF CALIFORNIA

2122 E. 7th STREET, LOS ANGELES

REPUBLIC

The BARTLETT HAYWARD CO.

BALTIMORE ***Engineers and Founders*** **NEW YORK**

MAIN PLANT LOCATED AT BALTIMORE, MD.

DESIGNERS AND BUILDERS
OF
COMPELTE COAL GAS PLANTS
CARBURETTED WATER GAS PLANTS
BY-PRODUCT PLANTS
DE BROWER CHARGING AND DISCHARGING MACHINES
SALT WATER AND FRESH WATER CONDENSERS
PURIFIERS
SHAVING SCRUBBERS
CENTRIFUGAL VERTICAL TYPE SCRUBBERS
STEEL TANKS

VERTICAL WASTE HEAT BOILERS
GAS HOLDERS

Would it interest YOU to see Checker Brick and Radiants in the making?

NO doubt a number of gas men attending the Pacific Coast Gas Association Convention at Pasadena have never had occasion to see refractories in the making. If you haven't —or have, for that matter—we want you as our guest. For those driving, the map below gives directions for reaching our plant, and if not, just call ANgelus 7350 and we will arrange transportation. Absolutely no obligation—our satisfaction is in providing what we hope will be an interesting side trip of informative value.

Amreco Checker Brick is made right to perform right!

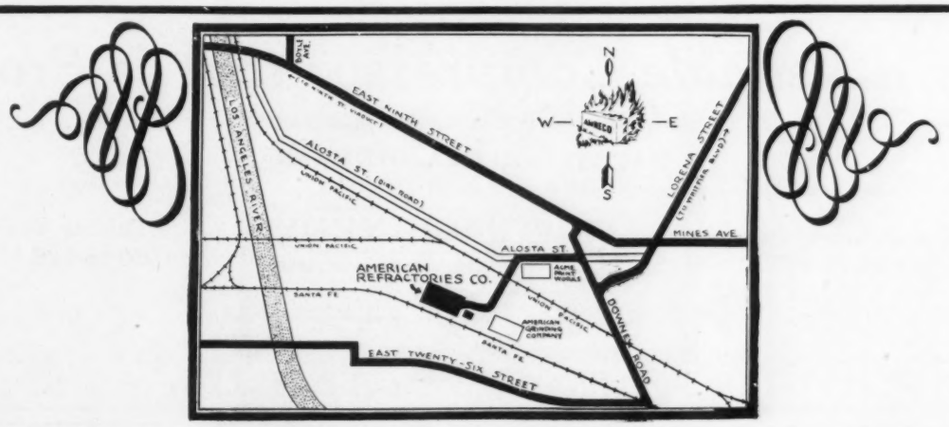
Amreco Checker is a stiff mud repress of properly proportioned flint and plastic clays. It has strength; is highly absorptive and resists slagging and abrasion to the utmost. Investigate Amreco TODAY!

AMERICAN REFRACTORIES CO

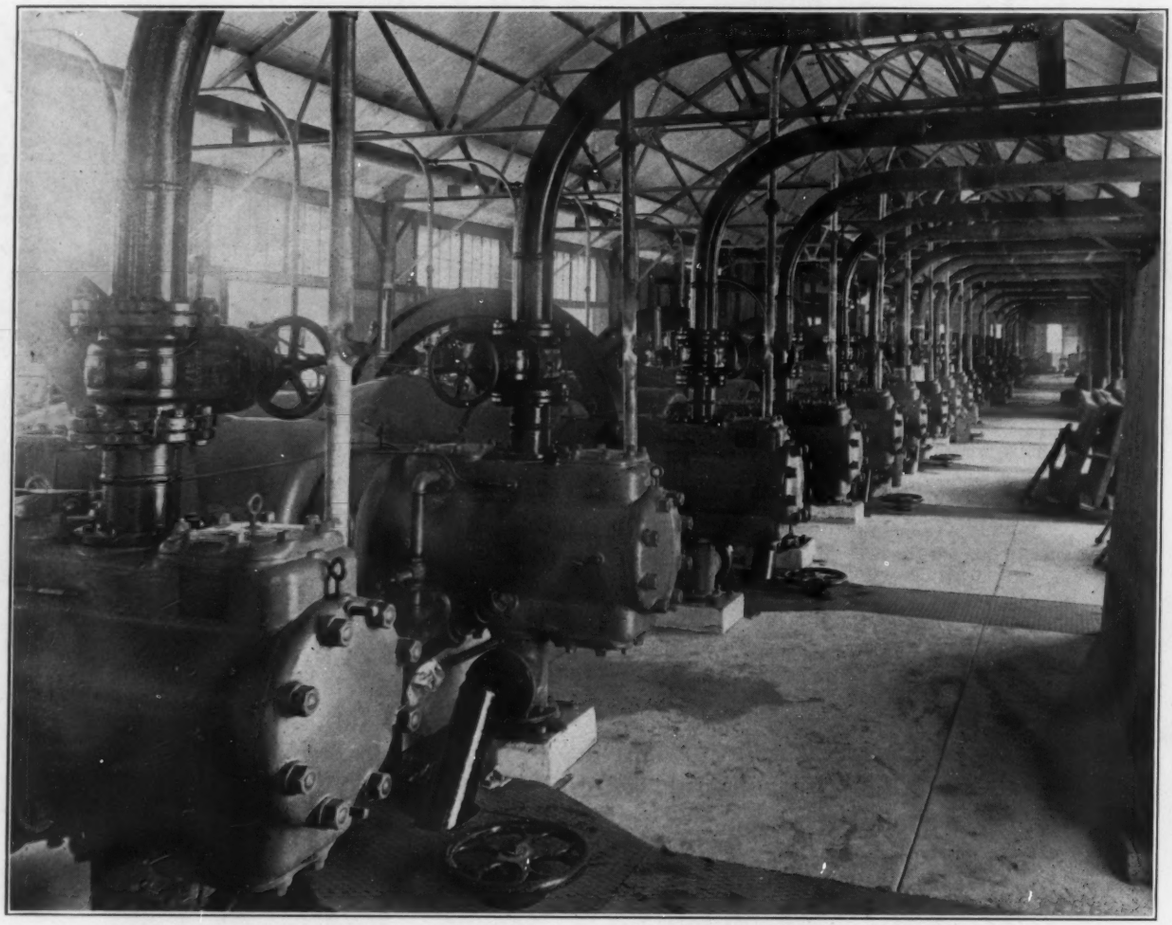
3132 ALOSTA STREET • LOS ANGELES

Telephone ANgelus 7350

MANUFACTURERS OF FIRE BRICK, FIRE CLAY AND REFRACTORY SHAPES



CLARKS



Production

In the last analysis isn't Production the one important point to consider when purchasing Compressors?

Such things as service, fair dealing, replacement of defective parts, etc., are considered essential by every reputable builder so that purchaser no longer questions these points.

What they are most interested in is "how much will the Compressor earn for me?" CLARKS have been standardized so long that their steady operation is assured.

Buy a Reliable Compressor that is Proven

Compressors
60 to 200 H. P.

SMITH BOOTH USHER CO.

CONSTRUCTION
ELECTRIC
GAS COMPRESSION
INDUSTRIAL
METAL WORKING
MINING
OIL FIELD
PUMPING
ROADMAKING
TRANSMISSION
WOOD WORKING

MACHINERY
PIPE - VALVES - SUPPLIES

SAN FRANCISCO
50 FREMONT STREET
BUTTER 952

LOS ANGELES
228 CENTRAL AVENUE
TRINITY 6911

Drilling Engines
60 to 125 H. P.

Traveling oven, 80 feet long and 9 feet wide at California Baking Company, San Francisco

Where enough bread is baked for an army of 140,000 men

AT the California Baking Company two gas-fired ovens, like the big fellow pictured above, turn out enough bread in one day to supply an army of 140,000 men. And every loaf of bread is baked and browned so uniformly that it is very difficult to tell one loaf from another.

That's because the oven temperature can be closely regulated so that each loaf of bread passes through exactly the same heat. This heat is produced right in the oven by 96 gas burners.

P G and E engineers will serve you

Pacific Gas and Electric Company engineers will gladly assist you in solving your heating problems. At all times you are entitled to their advisory service.

The P G and E engineers have information available on industrial heating operations which have been conducted successfully for many years. This service is at your command without cost or obligation on your part.

PACIFIC GAS AND ELECTRIC COMPANY

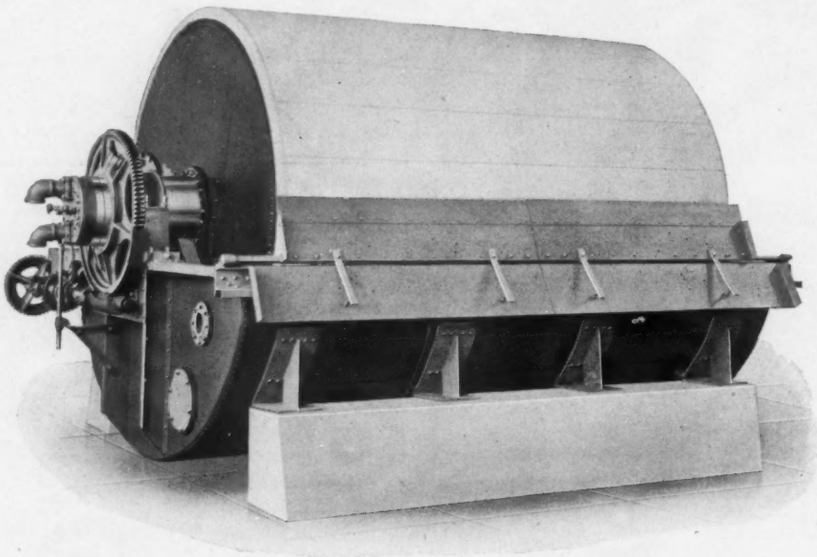
P·G·and E·

Owned · Operated · Managed
by Californians

IF IT'S DONE WITH HEAT, YOU CAN DO IT BETTER WITH GAS

Dewatering Lampblack

The Central Arizona Gas Company reduced space required 70% and operation costs 42% by using thickeners and an OLIVER filter. Installation handled by one man and the whole plant kept clean.



Oliver-Borden Thickeners

and

Oliver Filters

furnish the ideal method of dewatering.

Lampblack to furnaces or briquetting presses in the required condition without handling.

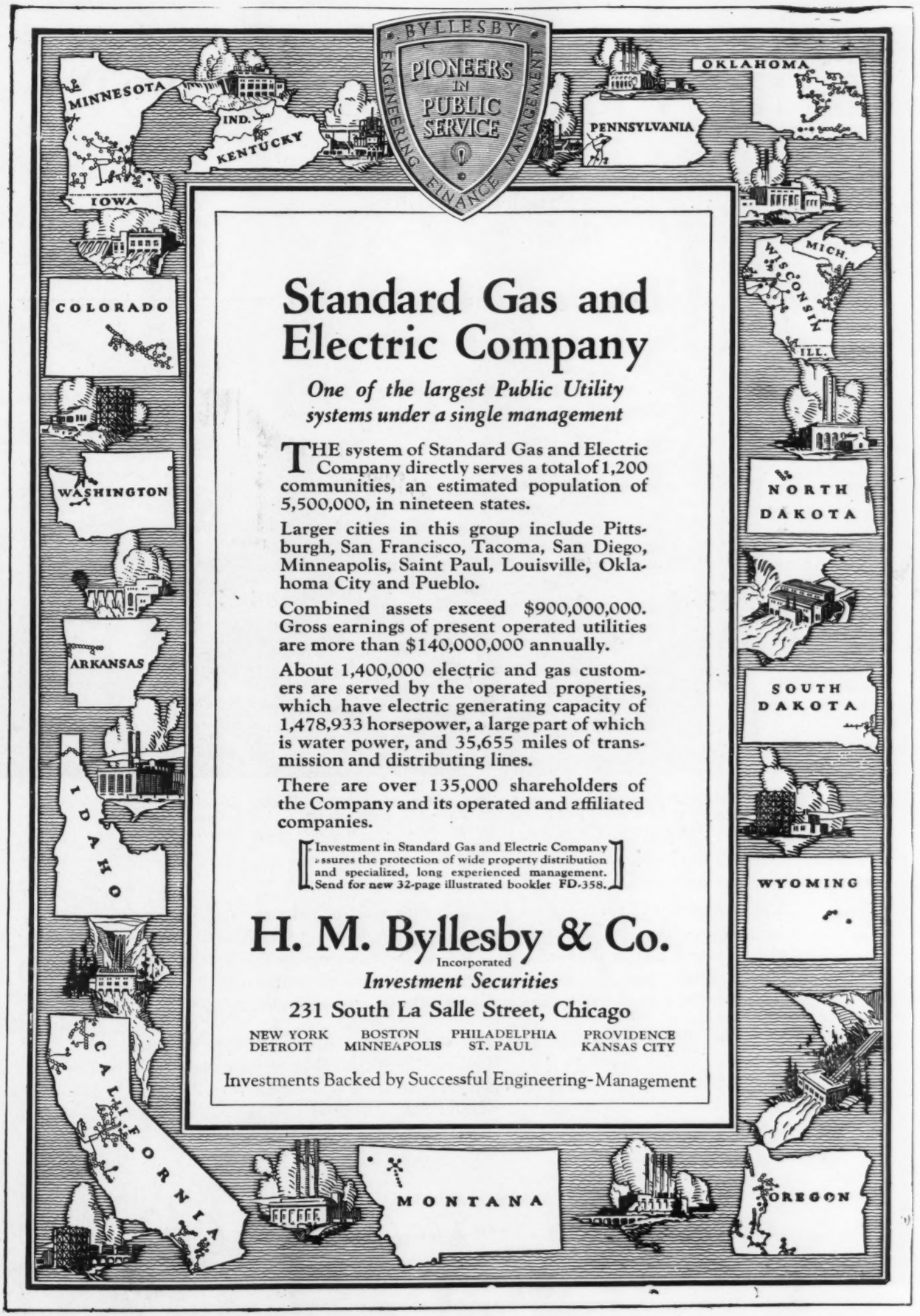
Oliver Continuous Filter Co.

SAN FRANCISCO
503 Market Street

NEW YORK
33 West 42nd Street

LONDON
11 Southampton Row

JOHANNESBURG, SOUTH AFRICA
E. L. Bateman, The Corner House



Standard Gas and Electric Company

One of the largest Public Utility systems under a single management

THE system of Standard Gas and Electric Company directly serves a total of 1,200 communities, an estimated population of 5,500,000, in nineteen states.

Larger cities in this group include Pittsburgh, San Francisco, Tacoma, San Diego, Minneapolis, Saint Paul, Louisville, Oklahoma City and Pueblo.

Combined assets exceed $900,000,000. Gross earnings of present operated utilities are more than $140,000,000 annually.

About 1,400,000 electric and gas customers are served by the operated properties, which have electric generating capacity of 1,478,933 horsepower, a large part of which is water power, and 35,655 miles of transmission and distributing lines.

There are over 135,000 shareholders of the Company and its operated and affiliated companies.

Investment in Standard Gas and Electric Company assures the protection of wide property distribution and specialized, long experienced management. Send for new 32-page illustrated booklet FD-358.

H. M. Byllesby & Co.

Incorporated

Investment Securities

231 South La Salle Street, Chicago

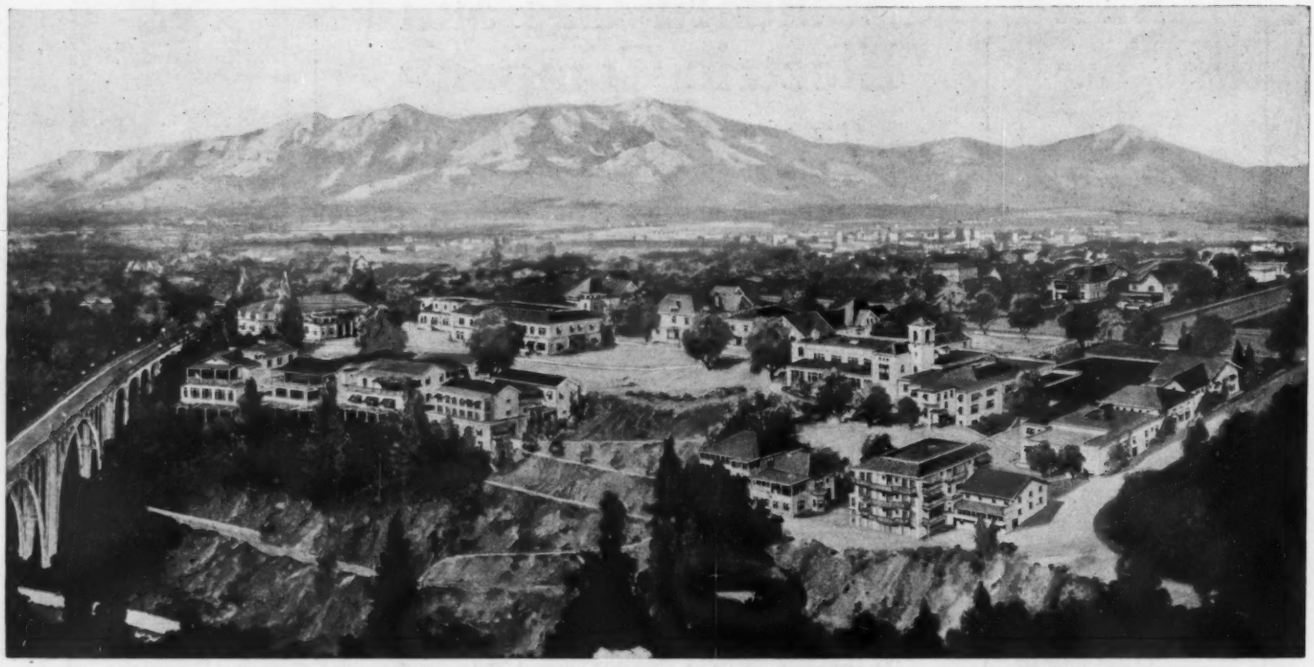
NEW YORK DETROIT BOSTON MINNEAPOLIS PHILADELPHIA ST. PAUL PROVIDENCE KANSAS CITY

Investments Backed by Successful Engineering-Management

THE VISTA DEL ARROYA

HOTEL and BUNGALOWS

Pasadena, California



Reproduced from an artist's oil painting, this view shows the 12-acre site of the Vista del Arroyo Hotel and Bungalows, Pasadena, Calif., the P. C. G. A. Convention Headquarters. All of the buildings shown in relief are Vista properties.

The management of the Vista del Arroyo extends a bid of welcome to all delegates and visitors of the 33rd annual convention of the Pacific Coast Gas Association. Decide to come and bring the family, make it your vacation. You will enjoy the homelike atmosphere, quiet and restful surroundings, the personal attention to guests and the unexcelled cuisine of the Vista will help make your visit a happy vacation.

The Vista del Arroyo is ideally situated as convention headquarters. It is only a short drive to Los Angeles, a five minutes walk to the golf links of the exclusive Annandale Country Club, and but eight minutes walk to the business center of Pasadena. The hotel is located on the banks of Arroyo Seco, where warmest summer days are tempered by cool breezes.

PASADENA---*The Convention City*

MUELLER
Improved Extension Service Boxes

Your experience
helped design these service boxes

In designing these improved, arch pattern service boxes, Mueller experience in manufacturing service boxes was not alone relied upon. *Your* experience in *using* them was also considered. Mueller engineers studied service-box construction from your angle—and designed accordingly.

No wonder then that these service boxes eliminate many of the shortcomings of ordinary boxes and include many important and practical improvements.

In the improved Mueller service box, special construction permits the raising of the upper section by frost without any harmful effects to curb stop or service. Only the upper section of the box is affected by the movement, and dirt is not allowed to fall around the bottom of the base. Easy access to the curb stop at all times is thus definitely assured.

The upper section of the box is of wrought iron and readily permits shortening or lengthening of the box to meet changes in grades. The base, made of heavy cast iron, is enlarged—insuring that the box will be held stationary where placed. The heavy cast iron lid is designed to be practically indestructible. The plug, threaded into a brass bushing cast into the lid, can be removed only with a special pentagon head wrench.

Let us send you full particulars.

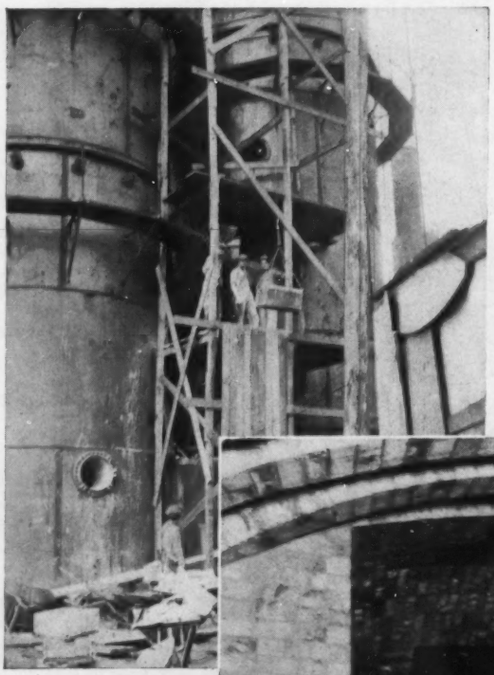
MUELLER CO. (*Established 1857*) *Factories:* Decatur, Illinois; Port Huron, Michigan.
Branches: New York, San Francisco, Los Angeles *Canadian Factory:* MUELLER, Limited, Sarnia

279

—MUELLER—

A brick formula for

The Gas Industry GAS CO



Typical Arch setting showing special shapes of Gas Co. Brick San Diego Gas Company

With the development of the oil gas process it was necessary to produce a high grade refractory for generator linings and checkers, that would take up and give off heat readily, that would not spall, and that would show a long period of service under the excessive heats and temperature changes of the generator set.

This brick was developed by the Stockton Fire Brick Company. It was named the Gas Co. and is now recognized as the standard brick for this purpose.

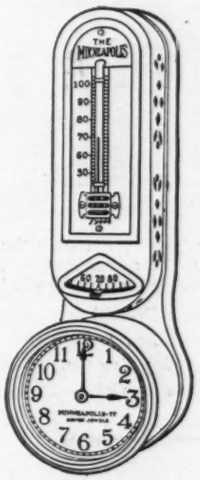
Stockton Fire Brick Company

Rialto Bldg
San Francisco

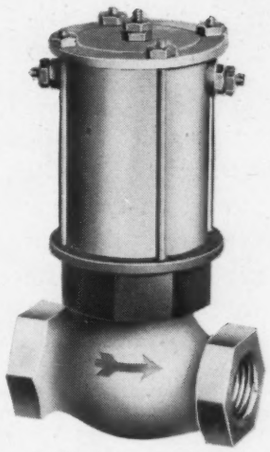
Works: Stockton,
California

Complete Controls for Gas

Arthur F. Erickson Company announce their appointment as Pacific Coast Distributors for the Minneapolis Heat Regulator Company of Minneapolis, Minnesota, in conjunction with their own proven line of Erickson gas valves. The famous Minneapolis line includes complete controls for every kind of gas installation, and is available in any type desired. Stocks of thermostats, motors and valves are available for immediate delivery in all principal Pacific Coast cities.



The "MINNEAPOLIS" HEAT REGULATOR



Reliability proven by five years use

Thousands installed everywhere

The Erickson Gas-o-trol

The Gas-o-trol is a simple electrically operated gas valve controlled by a Thermostat or push-button placed at a convenient point. With the Gas-o-trol and thermostat the temperature can be held to within two degrees of that for which it is set. For house, water or industrial heating. Saves gas and gives maximum convenience. Adopted as standard equipment by principal furnace and gas-boiler manufacturers—available in all sizes.

Write for catalog

ARTHUR F. ERICKSON COMPANY

Pacific Coast Distributors

Selling Building, Portland, Oregon

Branches or Major Dealers with stocks in all principal Pacific Coast cities

F. H. Bivens

"I read your book; not only the news items, but the advertisements, for it surely covers our gas needs."

F. H. BIVENS
Gen. Agent
So. Counties Gas Co.
Los Angeles, Calif.

W. H. Cohick

"Enjoy reading WESTERN GAS; also have had two occasions to look into the merits of advertised material."

W. H. COHICK
Supt. Gas. Dist.
Pacific Gas & Electric Co.
Oakland, Calif.

C. M. Grow

"I read each copy of WESTERN GAS—so does each of the 25 men in my department—advertisements included. Good magazine.

C. M. GROW
New Bus. Mgr.
So. Calif. Gas Co.
Los Angeles, Calif.

Keeping up to date in the Selection of Supplies and Equipment through the Advertising Columns of WESTERN GAS.

ONE of the most interesting as well as instructive departments of WESTERN GAS is the advertising section. Special care has been taken in the selection of the manufacturers' advertising in WESTERN GAS. Considerable time, thought and money have been spent in presenting these advertisements in such an attractive manner as to warrant your interest.

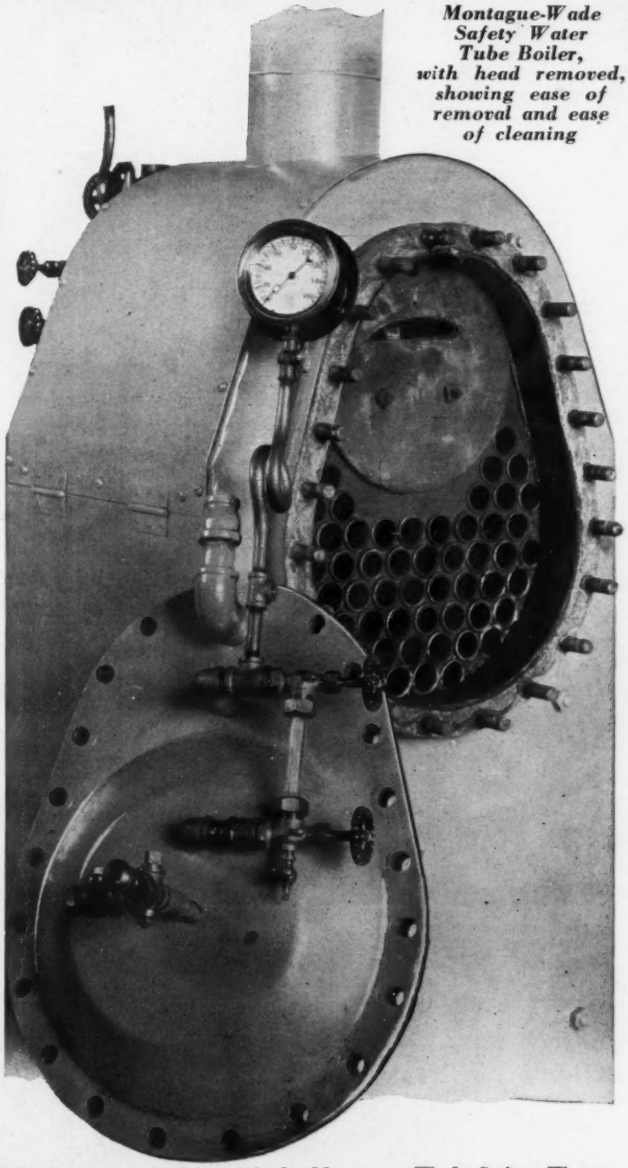
You will find the reading of these advertisements profitable, for they will keep you posted each month on the new developments of supplies and equipment that are applicable to our industry in the West.

WESTERN GAS

626 S. Spring St.
Los Angeles
Phone TU 8982

447 Sutter St.
San Francisco
Phone GA 2772

How the MONTAGUE-WADE SAFETY WATER TUBE BOILER tests out in actual *Service*



Montague-Wade Safety Water Tube Boiler, with head removed, showing ease of removal and ease of cleaning

Test made to determine the HP. and the amount of city gas consumed per horse power hour—

DIMENSIONS AND DESCRIPTION

Horizontal water-tube type, 59 tubes, 1¼ in. diameter, 47 in. long.

Firebox—Montague-Wade "V" type, extending under tubes entire length.

Burner—Montague-Wade non-back-firing unit type. Two draft openings, each ½ inch wide, under burner. Combustible space between burner and tubes, 2 cubic feet. Distance from burner to nearest tube, 1 foot.

Water heating surface .....66 square feet
Super-heating surface .....21 square feet
TOTAL HEATING SURFACE.....87 SQUARE FEET
DATE OF TEST—AUGUST 8, 1925.
DURATION OF TEST—3 HOURS.
FUEL BURNED—SAN FRANCISCO CITY GAS.
STEAM PRESSURE GAUGE—70 POUNDS.
TEMPERATURE OF SATURATED STEAM—316°.
TEMPERATURE OF FEED WATER ENTERING BOILER—59°.
Temperature escaping gases leaving boiler and entering stack .....480°
State of weather—clear, with light wind.
Temperature of external air.....59°
Temperature of air entering burner.....200°
PERCENTAGE OF MOISTURE IN STEAM.....1½%
Temperature of throttling calorimeter.....260°
Factor of correction for quality of steam.....98½%
TOTAL VOLUME OF GAS CONSUMED..3600 CUBIC FEET
Pressure of gas by water gauge.....6½ inches
Total weight of water fed boiler.....1360 pounds
Total weight of water evaporated.....1340 pounds
Factor of evaporation.....1.19
Total equivalent from and at 212°.....1594 pounds

HOURLY QUANTITIES AND RATES

GAS BURNED, PER HOUR.....1200 CUBIC FEET
Water evaporated, per hour, corrected for quality of steam .....447 pounds
EQUIVALENT EVAPORATION, per houru, from and at 212° .....531 pounds
EQUIVALENT EVAPORATION, per hour, from and at 212° per square foot of water heating surface..8 pounds

CAPACITY

Evaporation per hour from and at 212°.....531 pounds
BOILER HORSE POWER DEVELOPED...15.4 BOILER H.P.
Rated capacity per hour from 212°.....517 pounds
Rated boiler horse power.....15 boiler h.p.
Percentage of rated capacity developed.....103%

ECONOMY

Water fed per cubic foot of gas consumed..... .37 pounds
EQUIVALENT EVAPORATION PER CUBIC FOOT OF GAS BURNED ..... .44 POUNDS

EFFICIENCY

CALORIFIC VALUE OF CUBIC FOOT OF GAS BURNED .....550 B. t. u.
CUBIC FEET OF GAS BURNED PER HORSE POWER HOUR .....78 CUBIC FEET
TOTAL OVER-ALL EFFICIENCY OF BOILER (BASED ON COMBUSTIBLE) 78%

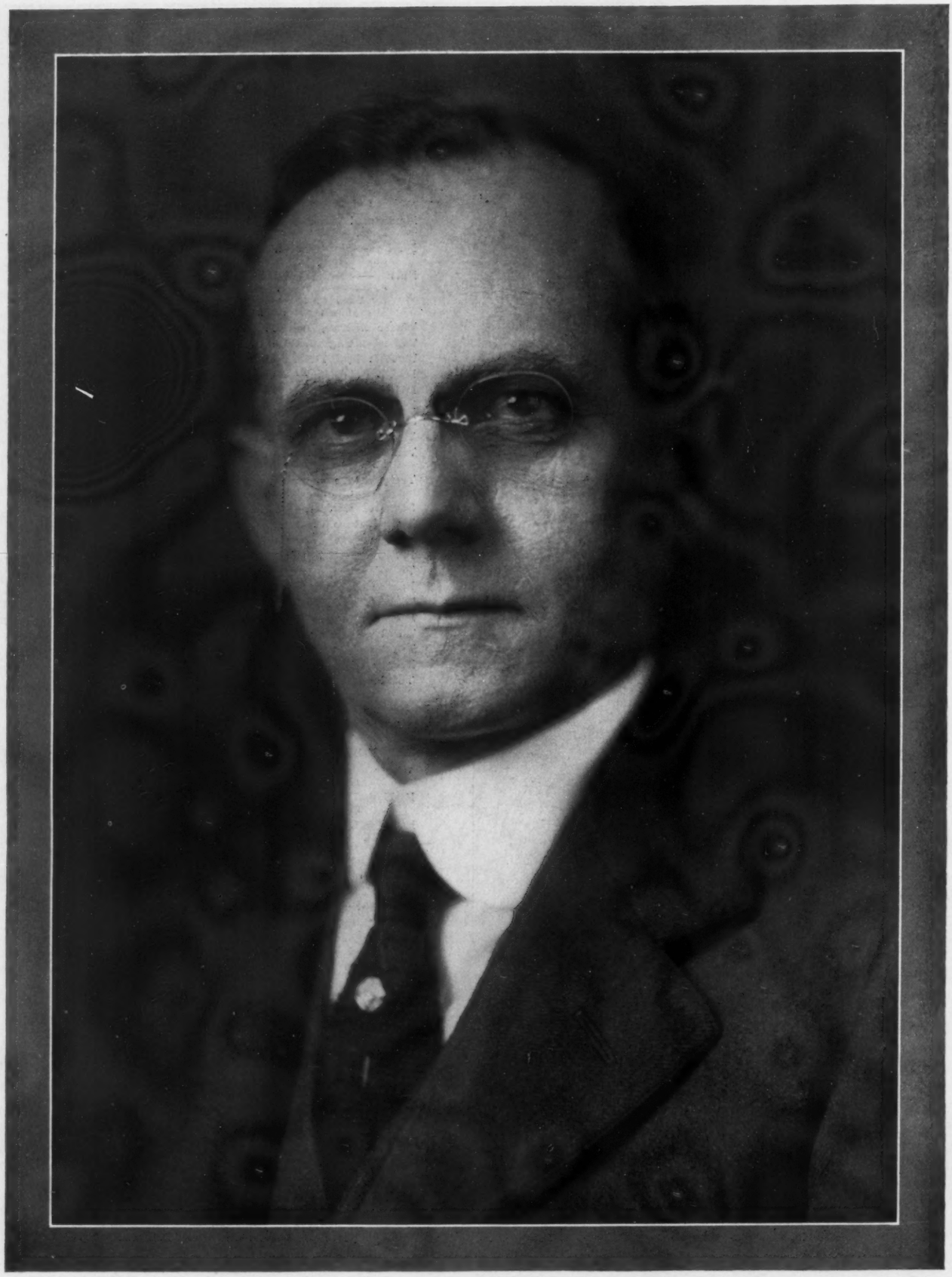
Replace your boilers with the Montague-Wade Safety Water Tube type and reduce your fire and liability risks, and be satisfied you and your workmen are absolutely safe.

MONTAGUE PIPE & STEEL CO

San Francisco · California

MONTAGUE-WADE WATER TUBE *Safety Boilers*

WELL CASING—RIVETED PIPE—SURFACE PIPE—IRRIGATION PIPE—OIL AND WATER TANKS—WELDED PIPE—SIPHONS—STACKS—FLUMES—CONCRETE FORMS AND OTHER STEEL PRODUCTS



F. J. SCHAFER, WHO AS 1925-1926 PRESIDENT OF THE PACIFIC COAST GAS ASSOCIATION, HAS RENDERED EFFECTIVE SERVICE TO THE GAS INDUSTRY OF THE WEST

WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in the *Eleven Western States*

A Gas Man's Business

¶ An open letter from the President of the Pacific Coast Gas Association to the gas fraternity of the Pacific Coast---particularly to the executives and leaders of the industry.

By F. J. SCHAFER

FROM the twenty-third to the twenty-seventh of August, 1926, the Pacific Coast Gas Association will hold open house at its Convention headquarters in Pasadena, the Crown City of the San Gabriel Valley, which nestles at the foot of the Sierra Madre mountains in the sunny south of California.

At the time and place mentioned will gather men from all branches of the gas industry of the Pacific Coast,—beginning in British Columbia and extending on down to the Mexican line,—to present and exchange problems and ideas bearing on the many-sided matters of interest and value to our business. The Technical, Commercial, Accounting, and Public Relations Sections will offer comprehensive papers and committee reports of paramount importance to all branches of gas activities, and every member and friend is cordially invited to attend and take part. It is only in so far as we participate in the work the Association is doing that we profit in return, and it is only as we profit that the Association succeeds in its mission.

THE ASSOCIATION A BUSINESS

This Association is a business, as much as any business, and we have no business in a business unless we do that business in a business-like way. In proportion as a business is guided by business, in the same proportion will that business tell business how business should be guided.

There is a great and growing need for active participation by the executive heads of various gas companies who rarely or never attend. This Association exists and has its being, primarily, in the interest of gas companies, and what is of interest to these companies is of necessity becoming more and more a matter of interest to the public. To this end the strong men of the industry should lend more liberal support and enthusiasm. True, each company member contributes its pro rata of the operating expense, for which we are duly thankful, but what the Association needs as much as, if not more, than money, is the contribution of personal contact and interest of men who stand high in the ranks of gas operations.

This Association—yours and mine—is a clearing house for a vast field of country-wide experience in gas practice, on which each member draws as his needs suggest, and there are many of our big men who could bring to it the flame of a better understanding, from which others could light the candle of knowledge. Success or failure is caused, not so much by mental capacity or incapacity, as by mental attitude; and mental attitude is the direct product of accumulated knowledge, good, indifferent or bad.

AN IDEAL FOR EXECUTIVES

The farmer considers the seasons, the miller looks to his mill race, and the sailor regards the direction of the wind. In like manner should the executives and leaders of the gas industry take stock of the times and the forces that govern their business, and establish a goal towards which their organization can work. As gas operators they should see to it that the heart beats high. As educators they should see to it that the tide of knowledge and experience is taken at the flood. As sociologists they should see to it that the public is made to see, to care, and to understand. When the worker knows what he is doing, when the stockholder knows why it is being done, and when the public has the information available to both, our chief difficulties will vanish. In proportion as these things are accomplished we are strong; as we fail, we are weak; and under Heaven there is no better agency than the Pacific Coast Gas Association to accomplish this high purpose if properly led and guided by those, who, pooling their forces, stand at the head of gas enterprises.

UNITED EFFORTS ACHIEVE

The single individual, no matter how dynamic, however he may be versed in the lore of economics or technicalities pertaining to any activity in life, is more or less a law unto himself, and it is a difficult or impossible matter for him to keep in balance. The most that can be said of him at his best is that he is erratic, subject to alternate spasms of optimism and pessimism, and that he labors under the heavy handicap of either excessive glee or gloom. He is productive one day, sterile another, and destructive the next. Man by and of himself is the most flighty creature on earth. His habits, practices, and customs rob him of the clear light of reason, and any-

(Continued on Page 96)

Open Road Leads *to* Pasadena *for the* 33rd Annual Convention

ON pages 60 and 61 of this issue will be found a complete list of features on the business sessions of the Convention. It is the purpose of this page to outline the main particulars of Convention arrangements.

During the five Convention days, August 23, 24, 25, 26 and 27, the Vista del Arroyo Hotel and Bungalows of Pasadena will hold open house to delegates and visitors as Convention headquarters. Reservations should be made directly with the Hotel immediately upon reading this notice, by any who have postponed taking this very necessary precaution. Names of guests being brought by delegates should be supplied to the Registration Committee.

Convention arrangements, from the Address of Welcome to the concluding Annual Banquet, are well in hand. Visitors and delegates will register at the booth provided for that purpose in the main lobby of the Vista del Arroyo, paying a $5.00 fee (ladies $2.50) which entitles them to share in Convention entertainment. In this are included a trip to Catalina and the cost of the annual banquet.

Wednesday Program

On Wednesday, August 25, business sessions will be temporarily forgotten, and the day will be given over to the men's golf tournament, and the Catalina Island trip. Those particularly concerned with details of the golf tournament may consult the announcement circulated from Association headquarters. Suffice it to say that Ernest Weston, of the Pacific Gas and Electric Company, who got a second leg on the Babcock-Pederson-Basford challenge cup last year, is coming to Pasadena determined to take home the trophy as a permanent possession, and contenders will have their work cut out for them. The stage will be set ideally for good golf, for the Annandale Golf course is among the best in the State, and lies just across the Arroyo from the Vista del Arroyo Hotel. All Convention men's golf will be played on this course. A number of special prizes will be competed for. The ladies will have a golf tournament all their own, to be played at the Flintridge Country Club.

RESERVE PASADENA CONVENTION DATES AUGUST 23 TO 27

¶ Executive Secretary Clifford Johnstone imparts the following hint of the valuable experience in store for those who come to Pasadena:

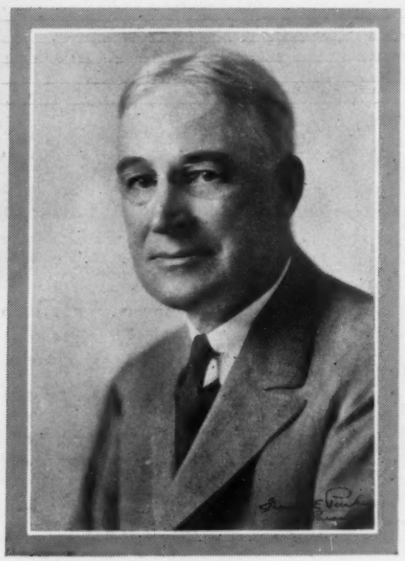
"From what has been written in Western Gas concerning the Thirty-third Annual Convention of the Pacific Coast Gas Association, and from contents of the circular recently sent out from the office of the Secretary, the impression may have been conveyed that the Convention week has been made a play time.

"To correct this impression, read the business program on pages 60 and 61, and read also the notable words written by our President, Mr. Schafer, which appear on page 45."

CLIFFORD JOHNSTONE

¶ The chairman of the Committee on Arrangements, W. M. Thompson, adds this word of caution to what has already been said of plans for attendance:

"Reservations for accommodations at the Vista del Arroyo Hotel are pouring in at a gratifying rate, but this should only serve to speed up the remaining registrations. Although the Hotel expects to be able to take care of everyone, there are bound to be disappointments resulting from last minute arrivals. Mail your reservations directly to the Hotel, without delay!"



W. M. THOMPSON

A Speaking Contest

Something novel in the way of luncheon programs is to be offered on Tuesday and Thursday of Convention week. This innovation is nothing less than a gas man's three-minute speaking contest. On Tuesday will be held a "limited" contest, with two speakers from each section—Accounting, Commercial, Public Relations and Technical—entered. These speakers, to be selected by Section chairmen, will have for their themes: "What the ——— Section has contributed to the gas industry during the past year."

Volunteer speakers will have their innings on Thursday, when any member qualifying may condense his ideas of "What is the greatest present need of the gas industry?" and deliver them on the luncheon program. D. L. Scott, Clyde H. Potter and F. H. Holden make up the contest committee, and notification of desire to enter should be filed with Mr. Scott, chairman, Los Angeles Gas and Electric Corporation, Box 1100, Station C, Los Angeles. Speeches must be written out and mailed to reach the committee by August 16. They will be graded on thought content only, 67 points being allowed for a perfect paper. In the Thursday contest only the writers of the 10 best manuscripts may compete; 33 points will be allowed for perfect presentation of the speeches. Trophies will be given for the best speeches of each day.

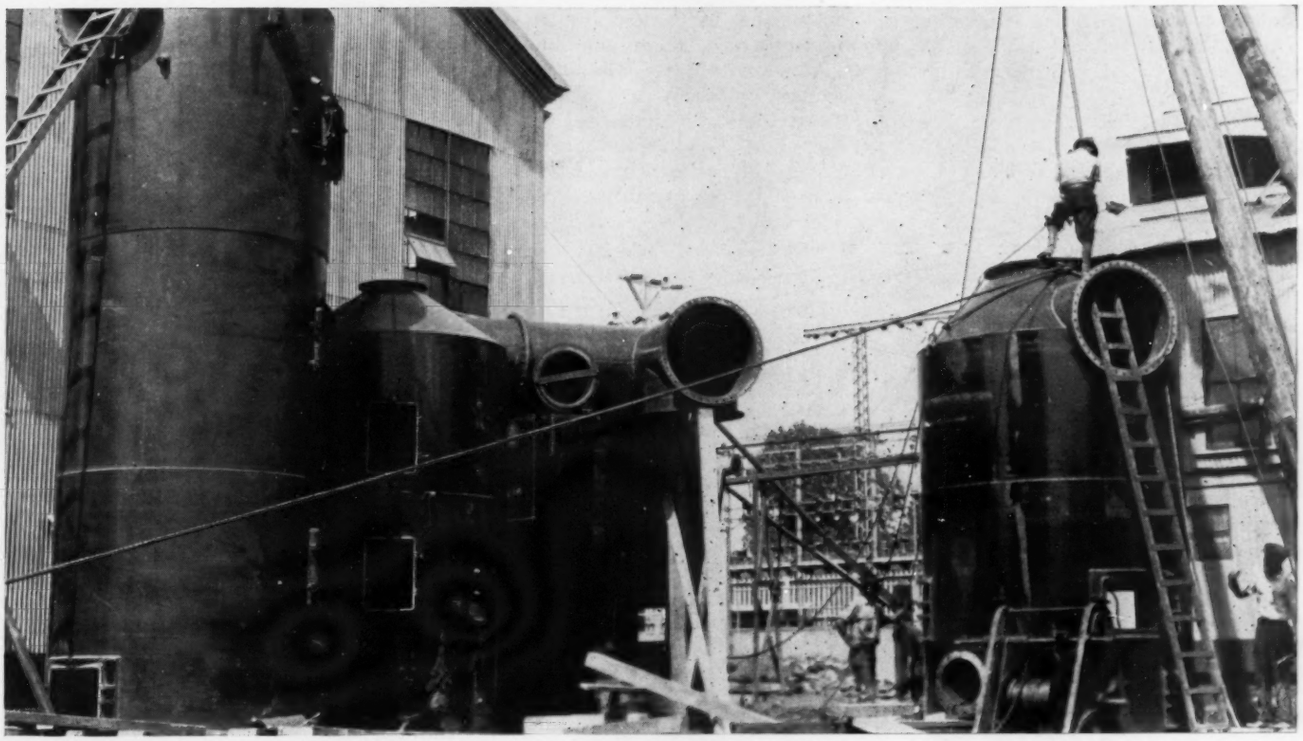
The luncheon programs will also include orchestra numbers and some stunts on which no present publicity is desired.

Ladies Well Cared For

Convention ladies have not been neglected in the arrangements for the Thirty-third sessions—far from it, as the following program testifies. In fairness to the men, it should be pointed out that they may share in several of the events listed.

The annual banquet, Friday evening, will stand out in everyone's memory as

(Continued on Page 95)



Placing the generators on their foundations and installing water gas sets at the Marysville, Calif., plant of the Pacific Gas and Electric Company. This plant is the first in California designed to operate on Western coals.

Study *of* Fuel Problems *in* Western Gas-Making

Summarizing *a* Year's Research *on* Fuels Available *for* Gas-Making *in* California

By WM. W. ODELL

Fuel Engineer, Bureau of Mines
Department of Commerce

¶ Gas men of the West have expectantly awaited the first announcement of results from the investigation of fuels available for gas making on the Pacific Coast, recently conducted by the United States Bureau of Mines in cooperation with the California Gas Research Council.

To W. S. Yard, vice-president in charge of gas construction and operation for the Pacific Gas and Electric Company, should go much of the credit for promoting this important task of research. Mr. Yard is himself recognized as one of the outstanding authorities on Pacific Coast fuel supplies.

Wm. W. Odell, fuel engineer for the Bureau of Mines, conducted the work of investigation, establishing headquarters in San Francisco on July 1, 1925. Most of the experimentation took place in the laboratory of the Pacific Gas and Electric Company's research department.

The following abstract, written for *Western Gas* by Mr. Odell, is a brief synopsis of a paper covering the fuel investigation which will be published by the Bureau of Mines. *Western Gas* takes considerable pleasure in offering its readers this synopsis—the first official information to be published on a most significant step in Western fuel research.

PRACTICALLY all the manufactured gas in California, with the exception of reformed gas made from natural gas in Los Angeles, is oil gas. The oil-gas process prevails to the exclusion of other processes because of the availability of cheap gas-oil and the lack of a readily available supply of high-grade solid fuel at a satisfactorily low price. The prospect is that in the immediate future the high-grade fuels available by importation from neighboring States or other sources will be on a competitive basis with oil, and the future developments of the gas industry will be along different lines; solid fuel will be the basic raw material used.

Consideration has been given to the possibility of obtaining a future supply of low-priced oil from present sources and from oil-shale. The indications are that oil will be used for gas making for a number of years to come; but it is evident that oil from oil-shale cannot be supplied to northern California gas plants at a sufficiently low price to maintain the exclusive dominance of the oil-gas process, nor can we expect to long continue getting oil from present sources at such a low price.

The conditions prevailing in the gas industry in California have been studied, and the applicability of the following gas-making processes to the needs of the industry have been considered:

(a) Coal gas; (b) Carburetted water gas; (c) Oil gas made by methods designed to give a maximum yield of by-product markets to a high degree; (d) Combination of (a) and (b), or of (a), (b), and (c); (e) Combined oil gas and carburetted water gas; replacing oil-gas equipment by coal-gas equipment as the price of oil advances, eventually making mixed coal gas and water gas, carburetting the latter to such an extent only as will be justified and determined by the relative prices of oil and coal and by the marketability of the coke. In this manner the oil-gas equipment need not be prematurely scrapped. Seasonal peak load to be cared for by oil-gas production utilizing present oil-gas generating equipment.

In view of the general fuel situation, it is recommended that, in general, the latter method (e) be chosen in the development of the gas industry in California.

Because of the big fluctuations in daily demand for gas, both seasonal and otherwise, coal gas can only be made as a small percentage of the total gas made,

since coal-gas generating equipment is not so "flexible" as either the oil-gas or carburetted water-gas generators in the production of gas having a high calorific value. Furthermore, at present there apparently is no appreciable demand for coke in California, particularly in the southern part of the State, and it is too expensive to be used as water-gas generator fuel in competition with coal. The latter will be true until the coal gas is worth so much for enriching purposes that coke can be made at an unusully low cost, a larger percentage of operating costs being charged to the gas, or an increase in the credits from the sale of gas and by-products other than coke. A small percentage of coke can be used to good advantage in making water gas when using bituminous coal as the main generator fuel.

The coals of the State and neighboring States have been studied and some were tested. Likewise the practicability of importing coal from foreign countries and from eastern States (shipped via water route through the Panama Canal) has been considered and discussed. The conclusions are:

CONCLUSIONS FROM COAL STUDY

(a) The coals of the State of California are not well adapted for use in gas-making processes now in common use. The best coal is found in Monterey County, but the sulphur content is high—prohibitively so until new purification processes are developed. This coal can undoubtedly be used mixed with other fuels in certain gas-making apparatus. It is not classed as a coking coal. The other coals are sub-bituminous to lignitic, and are not only non-coking but in many instances slack upon storage in the air, and are subject to spontaneous ignition. They usually have high percentage of sulphur, moisture, and ash, and yield a poor quality of both gas and char upon complete carbonization.

(b) The coal beds are folded and faulted to a degree materially affecting mining and tending to cause high mining costs.

(c) Tests made indicate that the sulphur and ash content of California coals cannot be materially lowered by coal-washing on a commercial scale.

(d) Coal of good quality and suitable for the manufacture of either coal gas or water gas can be obtained from Australia, Utah, and probably from eastern States, at competitive prices.

(e) Coal in lump size is not available from the State of Washington. Because of folding and faulting and the broken condition of the beds, as well as the inherent friability of these coals, an excessive amount of fines are produced in mining and lump coal is at a premium. In general, the best coals of this State are high in ash and are not so well adapted for making coal gas as the coals from Utah and elsewhere. However, coking coals may be had both in Washington and British Columbia (Vancouver Island) which can be used in the manufacture of coal gas.

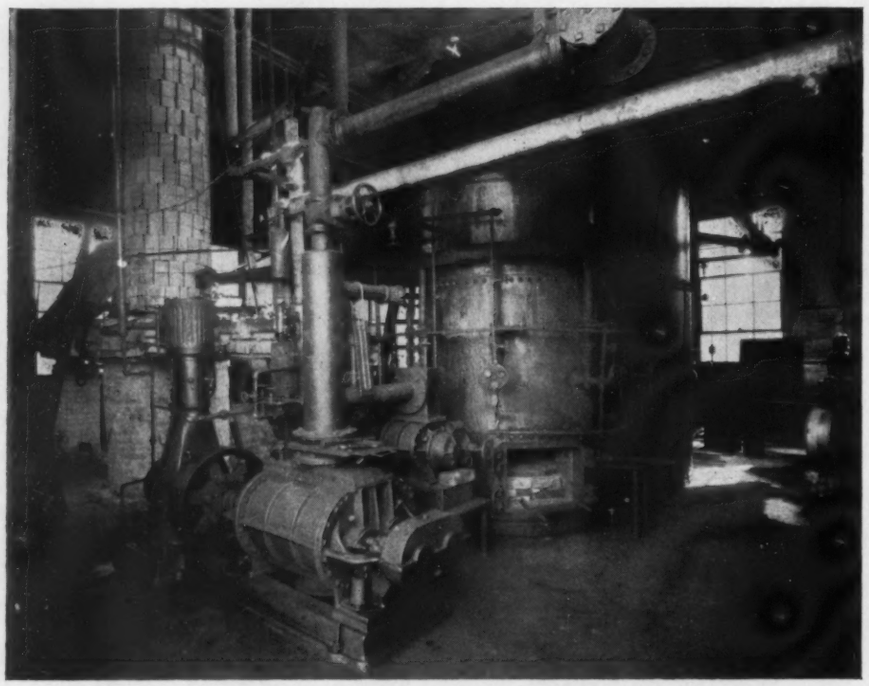
(f) Alaska coal is not now available at a price low enough to be of interest and probably will not be for many years.

(g) Eastern coals will probably be available in California because the shipments of lumber to eastern ports is volumetrically much greater than return cargoes, and a full load returning is desirable. In other words, the boats carrying lumber from California east can economically carry return shipments of coal at a rate which will be of interest to the gas industry.

NO SPECIAL UNITS RECOMMENDED

It is strictly not the intention to recommend particular units for carbonizing coal or for making water gas. Until a very recent date there has been but little difference in results obtainable in making carburetted water gas, and personal preference has been based on more or less minor details. However, there is appreciable difference at present based on new developments and progress in the use of coal as generator fuel. There has been considerable difference in carbonizing-apparatus marketed for coking coal, such as horizontal, inclined, and vertical retorts, and different types of by-product coke ovens. Which one is preferable for use in the different plants in California will depend largely upon, and vary with, local conditions. The author believes that it is good judgment, in selecting a particular oven or retort, to choose that type best adapted for use with the greatest variety of coals, for under emergency conditions it may be necessary to carbonize coal which would not otherwise be deemed suitable and which could not be used at all in certain types of ovens.

The influence of increasing cost of gas-coal upon gas standards has been considered, and it seems that in the future the gas supplied to replace straight oil gas will have a higher specific gravity and a lower calorific value than oil gas as now made. The ideal standard will not be the same in all locations, at least not for some time to come, because of local conditions, but in general the relative costs of oil and coal will be the determining factors; the higher the cost of oil with respect to the cost of coal the more economic it will be to decrease the calorific value of the gas within certain limits. The effect of changes in both calorific value and specific gravity of the gas in maintaining good service has been discussed. In spite of the difference in specific gravity, it is feasible to distribute mixed oil gas and carburetted water gas. Any necessary burner adjustments should be made to burn gas substantially midway the extremes of fluctuation. These factors have been discussed in detail.



Experimental water gas set in the North Beach laboratory of the P. G. & E., where much of the research on Western coals was conducted.

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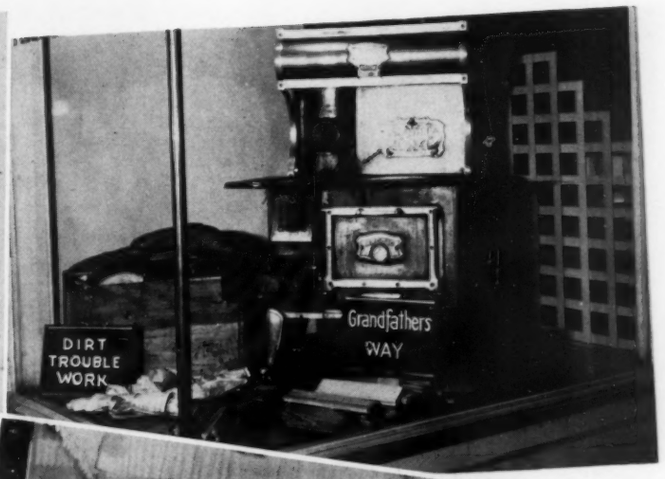
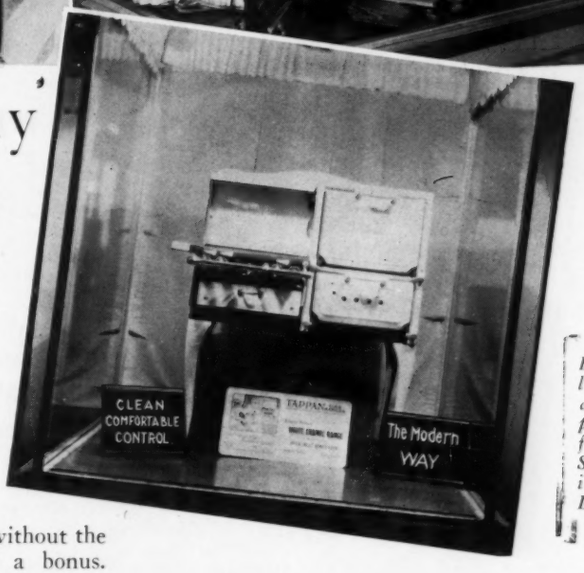




Here are "Evolution of Fuel" displays, recent prize winners for the Puget Sound Gas Co., in National Display Contest.

This Small Company Has Live Sales Policy

By C. E. LASHER
Puget Sound Gas Company

EVERETT, Washington, is a relatively small community, but the Puget Sound Gas Company turns over the gas appliance business nevertheless—and in spite of spirited competition from other fuels. Employee cooperation has been secured in bringing in new customers; timely sales helps such as cooking schools, and well-conceived window trims are used.

THE sale of gas appliances in a city the size of Everett, Washington (approximately 30,000) is a very different problem from that in cities of 100,000 and over, as the writer can vouch for. In the larger cities the gas company has a well defined sales department with salesmen trained in appliance selling. Also, in Everett, we have conditions where wood is the most used fuel on account of price. Thus the procedure has been along different lines.

C. E. Lasher

The first step was to instill confidence in all of the employees that the gas industry is really a live one and progressing every day. This was accomplished by the writer talking personally with every employee. Every time a sale was made or an idustrial consumer was taken on, we "tooted our horn" among ourselves so as to build up the morale.

RESULTS BEGIN TO SHOW

Shortly the men at the plant, the service crew and others commenced to turn in prospects without the incentive of a bonus. Then they began to spread the news around town of installations being made. All of this reflected upon the public attitude.

COOKING SCHOOL RESULTS

Last fall we ran a cooking school for a week, employing a very good lecturer. Each day saw more ladies attending. Sales resulting from the school at that time were negligible, but now we are having people coming to see ranges "like the one used at the cooking school." They still ask for copies of the recipes, indicating that they know food can be cooked *best* by gas.

Due to the fact that the gas office is located on a side street just off the main avenue, window trimming used to be neglected. This was changed. While not specialists, we trim the windows neatly and change them frequently. At special seasons, such as Thanksgiving, Christmas and so forth, we decorate the windows appropriately. Lights have been installed in the windows so as to illuminate them at night. The appliances are frequently shifted around on the office floor so that the customer will not see the same appliance in the same place all the time. It costs but little and the results obtained are very beneficial.

Newspaper space has been employed to a much greater extent than formerly, using cuts to illustrate the written matter and tying in with local events as far as possible. Space has been used at food shows with live display. Thus we have taken advantage of getting publicity whenever possible. For instance, in connection with Boys' Week we tied in a range sale at the same time by having Boy Scouts baking biscuits on gas ranges in the office.

BOY SCOUTS BAKE BISCUITS

The biscuit baking was in the nature of a contest. A Scout executive notified the various troops that Scouts who were anxious to qualify for merit badges in cooking could use this contest as a means of qualifying. The newspaper gave us considerable reading matter concerning the contest. On the appointed day 15 Boy Scouts appeared at different intervals to mix their dough and bake biscuits. The boys as a group were very orderly, but active and talkative. The gas ranges, of course, were the modern type with oven heat control, solid top, insulated oven, and full enamel type.

The mothers came and watched the

(Continued on Page 80)

EDITORIAL

Appealing to Executives

IN THE opening article of this issue of *Western Gas* President F. J. Schafer sounds a timely note, intended for the particular ear of the gas executive. It is urged that executives let nothing stand in the way of their attending the Pacific Coast Gas Association Convention sessions at Pasadena, August 23 to 27; for, says President Schafer, to whom shall Association members look for inspiration if not to the industry's leaders?

Association activity is important enough to have experts at its helm. Considerations of duty, as well as of inclination, should bring a high proportion of gas company executives to Pasadena. It is well enough to say that conventions are schools for the younger men in an industry, but every school has its instructors. Leaders must share of their larger experience if followers are to gain. And determination of the direction of Association effort and policy properly belongs with those guiding the course of gas utilities throughout the West.

What the Reports Tell

IT HAS been our privilege during the production of this issue of *Western Gas* to scan a considerable number of the committee reports which are to be delivered in the sectional meetings of the Convention. Many of these reports have been abstrated for publication in this issue, and a reading will yield profit and entertainment, as well as give some slight foretaste of what will be offered at the Convention.

While most of the reports themselves are evidence of much worth while and effective committee work, accompanied by a good measure of company cooperation, they do not always reflect satisfactory conditions in member companies of the Association. It is not difficult to find indications of progressiveness in Western methods of gas operation; some of the most widely approved and utilized practices of management—such as that of encouraging customer ownership of securities—have originated in the West. But progress does not come from content with past accomplishments, or back-patting, and it is well to look at the other side of the picture.

An outstanding need in almost every department of gas company operation is that of standardization; standardization in types of plant equipment best suited to meet a given condition; standardization in cost accounting methods, that practices and results among many different companies may be compared. This matter of standardization has had its due of attention on Convention programs and in committee activity; yet in spite of this recognition of its importance, the progress toward actual standardization is deplorably slow.

Through Association effort much may be done to determine what is good practice, and to point out where member companies are running counter to good practice, or failing to adopt methods known to be effective. But only the companies themselves can bring about the reform. Thus the committee on bonus, premium and group insurance—representing a new line of Association endeavor—reports that only three companies out of 25 replying to the committee's questionnaire were using the bonus system, and only one of the same number used the premium. All four of these utilities report decided benefit in lessened labor turnover and in lower costs resulting from these practices. It will be interesting in the extreme to watch the reaction to this report, and others like it, from member companies which should be "in the market" for some betterments in operating methods.

The burden of this message is that Association work is fruitless, unless company members will take its lessons to heart. The moral is that annual conventions provide the chief opportunities for absorbing new ideas. Another obvious implication is that close cooperation of companies in the work of the Association is an outstanding force for progress in originating and applying better methods of gas operation.

Small but Mighty!

THROUGHOUT our great West there are a host of gas companies operating in small communities. Although Association work is making more contact possible between large and small companies, it is too often the fate of most of these smaller utilities to perform their essential services in relative obscurity. But this does not imply that they are necessarily backward. The article on small gas company merchandising written in this issue by C. E. Lasher of the Puget Sound Gas Company, Everett, Wash., tells interestingly of one small utility that is applying modern methods to its problems, and successfully bucking a tide of competition.

The Convention *in* Session

Authors *of* Convention Papers, Committee Chairmen, and Committeemen Have Co-operated *with* WESTERN GAS *in* Offering These Special Abstracts *of* Program Features

Better Methods *of* Handling Customers' Transactions

The following abstract of the report of the Committee on Improved Methods of Handling Transactions with Customers was prepared by O. L. Moore, Los Angeles Gas and Electric Corp. On the committee are: J. G. Bourus, chairman, F. C. Brewer, R. G. Gentry, F. C. Ingram, A. May, O. L. Moore, F. L. Nagel, F. E. Oldis.

THIS report states that the main reason for intensive work and study by various sections and committees of the Pacific Coast Gas Association is because of our sincere desire to win and hold the friendship of our boss, "The Public."

J. G. Bourus

This winning of the "Boss," in simple language, seems to be a problem of humanizing business. The complexities and magnitude of our job of furnishing superlatively excellent gas service at a price have caused us, until recently, to lose sight of the more important matter of developing friendly human relationships, which cannot be bought.

While this is essentially a mechanical age, no one has yet found a way to bring human nature under the control of mechanical devices and we still have human nature to deal with, after every other problem of utility operation and service is solved. Customers like to be considered individually and personally. It is the personal touch that wins—it is the mechanical method that loses. The human equation between the customer and the employee is ever present and cannot be removed. It makes but little difference whether the community served is a village or a metropolis, success lies in pleasing the individual customer and every type of conduct shown by public utility employees in dealing with customers may be classified as expressing either *interest* or *indifference* in one form or another. In the eyes of the customer there can be no half-way point; there must be marked interest shown by the company's representative or the customer considers the attitude to be an indifferent one. There should, therefore, be an atmosphere of sincere interest preponderant in every contact in order that the customer may experience the right reaction. It follows, therefore, that any method designed to result in friendlier relationships must have its genesis in the proper selection, education and training of the employee, who is always the company, from the customer's viewpoint. Regardless of the differing conditions in different localities, plenty of evidence is at hand to indicate that it pays in all companies to ascertain the effect of prevailing methods and to apply corrective measures, either by change of company policy or further education of employes or both.

SERVICE AND PERSONAL CONTACTS COUNT

Surveys of various kinds have been made resulting in the discovery of the two following most important facts:

1. The good will toward the company is based almost entirely upon the service the company renders (service is about three times more important in the public's mind than any other consideration.)

II. The public judges the quality of the service by the pleasantness or unpleasantness of its personal contacts, with the employees engaged in rendering it, including every detail of it from answering the telephone, to installing gas-using equipment.

A responsibility greater than that resting upon the employees, is the responsibility in this problem lying upon the shoulders of utility managers. Various managements have assumed their portion of this work by inaugurating public relation departments, operating under the supervision of a competent director whose work is built around the idea that what employees need more than technical knowledge is a deeper human understanding.

Whether the name of "Director of Public Relations" and "Public Relations Department" are the best names for this special branch of utility work, has been seriously questioned. Some feel that "Special Assistant to the Manager" or "Special Agent" would add dignity to the position and convince the customers that they are dealing with a company official.

SALES OPPORTUNITIES

The proper solution of this question of "Improved Methods of Handling Transactions with Customers" seems to be "Superior Salesmanship." It should be a matter of company policy and of company practice that every transaction should have in it the thought of "Salesmanship." The reasons are perfectly obvious; every transaction with every customer is a sales contact. In literally thousands of ways the company is being "sold to the customer" month in and month out, year in and year out. Considering the monopolistic character of the utility business, from the customer's standpoint, is it not vitally essential that all energies be focused on "the Sale"?

For the reasons stated, the committee recommends that the members of the Association try at least a year's campaign of visualizing every public contact as a sales opportunity with a slogan which might well be,

"Every Employee a Salesman."

Advantages *of* Tripartite Gas Rate Schedule

An abstract of a paper from the Rate Committee, prepared by Rudolph Jenny of the Pacific Gas and Electric Company, chairman. H. L. Masser will discuss this subject from a technical rate-making standpoint, and F. M. Banks from a sales standpoint, following the presentation of Mr. Jenny's paper.

THE gas industry is confronted with some practical conditions of great importance, and with some problems that require whole hearted, cooperative effort and the best thought of the industry in their solution.

The utilization of gas, commencing over one hundred years ago as a means of illumination, has advanced through successive stages of uses to domestic cooking, to domestic and commercial heating, and now, finally, to industrial uses. Many industries have come into being that are absolutely dependent upon gas as a fuel. There are over 5,000 separate and distinct uses to which gas is being put. The potential load in the gas industry field is practically unlimited. Industrial uses are increasing tremendously.

Rudolph Jenny

The gas industry is facing the situation of having to meet these new demands created by a growing public for commercial heating and industrial service. This public expects the industry to perform a maximum amount of service, to become a public servant in every sense and meaning of the word, and an instrument in the development of the community and the country. The responsibility of meeting these demands, and of supplying all the gas required, has been, and will continue to be, assumed and met by the gas industry.

THE PROBLEM OF RATE STRUCTURE

This brings on an equally important matter—the other side of the question—that is, the rate situation. It is here that a serious problem confronts us. The engineering and operating technique, required to produce and distribute gas, is complicated by the necessity of devising a rate structure that will adapt the charge for gas service to the economic conditions under which it must be used.

Nearly everyone uses gas service in some way or another. To some it is a luxury, to others a convenience, while to still others it is an absolute necessity. Some consumers

find that gas has no substitute, while to others the margin between cost of gas and some other fuel is so narrow that, were it sold to all alike at a flat uniform rate, it would result in restricting its use. Then there is the group that yet remains unserved by gas, embracing those numberless potential consumers who depend upon a cheaper competitive fuel, and who could be won over to the gas industry lines by a better and more advanced theory of rate structure.

The ideal rate schedule—a three-part rate placing a value upon "customer service," "peak service," and "gas"—is designed to bring about a maximum use of gas service, and of the utility's serving facilities. The nearer this is brought to full accomplishment, the lower the over-all average cost of service; and as rates are based on cost, all consumers will benefit by lower rates.

THREE COMPONENTS ARE DISTINCT

These three components of a tripartite rate are separate commodities and should sell at prices fixed upon each, based on value and worth. The fair value of each cannot be charged to a consumer when sold as one article, and at a combined price. Recognition that the service of supplying demand is distinctly separate from that of supplying energy, consequently, must be priced separately, is very noticeable in electric rate schedules. The remarkable and continuing growth of the electric industry is largely attributed to, and can be traced back to, the development of demand and energy rates in electric rate schedules.

Few Pacific Coast gas companies are as fortunately situated as those east of the Rocky Mountains in serving loads of off-peak type, or of large industrial centers. Our peaks are two and one-half, and with many companies, over three times the ratio of the average daily sendout. The heavy demand of the heating load is on the line at a maximum for only a short period of the winter season, necessitating plant and feeder capacity adequate to serve, much of which remains idle throughout most of the year.

"SPREADING" THE CARRYING CHARGE

The rate structure should apportion the carrying charges on this idle investment over all the monthly bills, thereby shifting some of the high heating bill, which includes carrying charges for months other than the winter, or heating season, over to the summer period where it properly belongs. This would obviate practically all the high heating bill complaints and return to the utility an income commensurate with the cost of service for all months of the year. With a reduction in the winter heating bill, there is a likelihood that a heating consumer would use his appliances a longer period each day during the heating season, thereby improving his load factor and increasing the company's receipts.

The tripartite rate would protect the gas utility against losses incurred in supplying the domestic cooking consumer (using gas only intermittently), and too, those very small commercial consumers, both of which classes use gas in such small quantities that the cost of serving is generally in excess of the revenue derived, figured on a one-price gas rate. The greater percentage of a utility's patrons use less than 3,000 cubic feet a month. These consumers should pay their share of the cost of gas service.

ATTRACTING DESIRABLE BUSINESS

High annual load factor business is very desirable. With rates distinguishing between groups and classes of consumers, and with a spread of costs predicated upon the three part cost allocation, and with the further very important consideration that rate making is a problem to be viewed in the light of furthering the economic development of our nation, requiring study of the economic maximum and minimum value of the service to each class of consumer, there should result a rate structure that will attract this highly desirable business.

The tripartite form of gas rate is founded upon sound, economic principles. It will conserve capital expenditures, limit consumers' peak demands, improve the operating load factor, increase sales, and decrease the average cost of supplying gas service. With such decided advantages to be gained by the adoption of the three-part rate principle, the gas industry may go forward with the full realization that it has done its duty to the public and to its owners.

Customer Ownership *of* Securities

An abstract of the report of the Committee on Customer Ownership of Securities prepared by F. E. Seaver, chairman of the committee and assistant secretary of the Los Angeles Gas and Electric Corp. Other members of the committee are: S. C. Singer, Southern California Gas Co.; Clyde H. Potter, Southern Counties Gas Co.; M. B. Fowler, San Diego Consolidated Gas & Electric Co.; C. E. Holt, Pacific Gas & Electric Co.; S. E. Skelley, Portland Gas & Coke Co.; Sumner C. Palmer, Jr., Tacoma Gas & Fuel Co.

PUBLIC relations questions apparently will equal or perhaps surpass in importance all other issues in utility affairs, as the cultivation of public good will is rapidly assuming a paramount position in the deliberations of the executives of utilities. Whatever activity is contemplated, whether it be one of expansion, finance or establishment of policy, this eternal question arises: "What will be the reaction of the public mind?"

F. E. Seaver

An important basic factor serving to mould a more favorable public attitude towards utilities, is the comparatively modern movement of Customer Ownership of Utility Securities.

It is believed that there is no valid argument in favor of a cessation of this movement on the part of utilities. A customer or employee obtained as a shareholder, particularly as a result of direct sale, will doubtlessly take greater interest in the problems besetting the utility than if not participating in the profits of the business. Intelligent public understanding of the intricate and continuing problems of the utility is a matter of importance. Therefore, the utility should lose no opportunity to enlighten the general public as to its ambition and intention to enlarge and better its service, thereby counteracting the rather adverse opinion existing in the public mind, one conceived long ago and since handed down from generation to generation.

ECONOMIC DEVELOPMENT

Present day development of utilities may now be correctly classified as an economic one. Their continued expansion has ceased to be a matter of political favor, being recognized as a necessary factor in the growth of communities. Therefore, it is obvious and natural that interest created by the customer ownership movement will become an important factor in eradicating old prejudices against corporate, particularly utility, managements.

This comparatively new order of affairs shows its influence upon utility managements in the dictation of their policies. That the passing of those characters who dictated the policy of corporate control for their own exclusive betterment is evident, and their replacement by alert, brilliant executives who will control the destinies of future utilities for the opportunity of administrative prestige and the glory of perfecting public service, is the opinion of some of our leading financiers and economists.

Samuel Lindsay, Professor of Social Legislation, Columbia University, states that "The growth of industrial capital in the form of joint stock ownership during the last 50 years has been, until recently, characterized by comparatively narrow holdings in increasing aggregations in few hands." That almost unnoticed an economic evolution has taken place with increasing rapidity; and that the tendency now seems to be towards the general diffusion, through small proprietorship, of the productive capital of the country.

CLASS OR GROUP CONTROL

The question has been raised by some economists regarding the possible danger of the development of group or class control from too widespread indulgence by utilities in the customer ownership movement. Without doubt, were this condition to exist, it would be disastrous to the progress of the movement and its usefulness to both utility and public, but at present there seems to be no cause for apprehension, as a careful survey of our industry fails to disclose any tendency towards extra-executive control by either employees or customer stockholders.

The movement of customer ownership of utility securities also serves as a corrective of any drift toward political domination, as usually exemplified by governmental or municipal ownership. It also affords that real public ownership of utilities that comes from the admission of customer, employee and public as partners through investment in utility securities.

Apathetic and discontented workers are usually transformed into enthusiastic men and women, zealous for the welfare of their organization, when offered the opportunity to participate in profits of the business as shareholders.

CONTINUOUS STIMULATION NECESSARY

Considerable impetus has been given this movement in recent years, but why a plan of such momentous advantage to all concerned should have been so long denied consideration, has never been explained. However, it is now an established movement, but diligent care must be exerted that it does not retrograde to the state of lethargy existing in previous decades. The small proprietorship idea needs continuous stimulation or it will be overcome by the old tendency of control by a comparatively few barons of industry, who stand ready and prepared to assume the shares of small investors whenever opportunity affords.

The birthplace of the customer ownership idea is now generally recognized as being located upon the Pacific Coast, and this section has probably adhered more closely than any other locality to the program of direct sales of stock to customer and employee, and has enjoyed the benefits accruing from the movement in proportion.

Those interested as shareholders now un-

derstand that a utility is not the deadly enemy of the community that it has hitherto been portrayed, but on the contrary is the constant and powerful promoter of its welfare and the purveyor of an indispensable service and convenience to its inhabitants, for which it asks only a reasonable profit upon its investment.

STOCK SALES EFFORTS AND 1925 RESULTS

There was a healthy increase in the total number of stockholders and of shares held in the coast utilities securities during the year 1925, with the exception of employee stockholders, this classification showing a slightly decreased number of stockholders but an increased number of shares held.

The year also showed a general decrease in stock sales efforts, as many of the utilities found themselves with sufficient or surplus capital because of the cessation of the demands for extensive expansion that had existed since 1920 or 1921. Their securities, however, having been greatly popularized by intensive educational campaigns, were in constant demand, while the purposes for which the stock was originally offered had ceased to exist, except insofar as those purposes embraced the effort to promote better public relations through interesting the public and employees in investment in utility securities. On account of this condition, and in spite of decreased stock sales efforts, a majority of the companies reported an increase generally in shares sold.

The regular employee of the company has been a potent factor in successfully launching the customer ownership movement. It is the opinion of many connected with utilities that sales negotiated by employees to their friends and acquaintances not only are made at a reduced selling expense to the utility, but created a wider circle of good will than those made through any other agency.

Committee *on* Measurement Natural Gas Bureau

An abstract prepared by Ralph L. Cook, chairman of the Measurement Committee of the Natural Gas Bureau, and superintendent of measurement for the Midway Gas Company. Membership of the Measurement Committee: R. L. Cook, chairman, Midway Gas Company; John O. Wiley, Westcott & Greis, Inc.; B. M. Laulhere, Midway Gas Company; W. A. Spencer, Southern Counties Gas Co.; M. J. Cereghino, Los Angeles Gas & Elec. Corp.; G. B. Reece, Southern Counties Gas Co. H. P. George, general superintendent, Midway Gas Company, is chairman of the Natural Gas Bureau.

THE committee on measurement has included in its report for this year a study of some of the differences arising from the measurement of gas by orifice meter. We have limited our report to orifice meter measurement as this is the most common method now in use by utilities handling natural gas in large volumes. These differences, among others, may be listed as pulsation, foreign substances, and errors in pipe and orifice plates. In addition to this, we have also reviewed the problem of leakage from pipe lines.

(1). Pulsation: After viewing all the available data and experimental work done on the subject of pulsation, the committee has reached the conclusion that a correction factor cannot be applied to chart readings to correct for errors due to pulsation. It is necessary to eliminate pulsating flow in a pipe line before accurate measurement may be obtained. Methods of restricting gauges make for better reading charts, but may not necessarily improve the measurement of the flow of gas.

(2). Foreign Substances: Considerable has been written in former reports on this subject and your committee reports on the matter of water vapor carried by the gas itself.

A great many gases carry water vapor. Its volume may be computed by use of the Law of Partial Pressures, after determining the relative amount of saturation of the gas. The partial pressure due to water vapor depends on the temperature and the pressure of the gas, and increases rapidly as the temperature increases and the pressure decreases.

An example will illustrate: 1,000,000 cu. ft. of saturated gas was metered at 80° F. and 10 lb. gauge, with barometer of 14.7. The vapor pressure of the water vapor at 80° F. equals 0.5027 lbs. per square inch and the pressure due to the dry gas equals $24.7 - .5027 = 24.1973$ lbs. The volume of dry gas is then $\frac{24.1973}{24.7} \times 1{,}000{,}000 = 979{,}647$ cu. ft. The difference is water vapor. If this original volume of 1,000,000 cu. ft. is compressed to 100 lbs. and cooled to 60° F., the total volume of dry gas becomes $979{,}647 \times \frac{.2545}{114.7} + 979{,}647 = 981{,}821$ cu. ft., or a net loss of 18,179 cu. ft., lost in the compression process.

(3). Errors in pipe and orifice plates: Too much stress cannot be laid upon the accuracy of machine work in orifice plates. Errors of .002, .003, or .004 of an inch are frequent and seriously affect measurement by orifice meter.

Another cause of inaccurate measurement is in the pipe selected for the meter set-up. It should be very close to the standard size called for. Errors as great as 5% in measurement are frequent, due to varying sizes of pipe.

LEAKAGE TESTS IMPORTANT

(4). Leakage from Transmission Mains: During the past year the Bureau of Mines, in conjunction with the Natural Gas Association of America has tested twenty-six representative natural gas transmission lines, of screw, welded and rubber coupled construction. The work done showed the necessity for gas pipe line operators to keep accurate checks on their transmission systems, by sytematic leakage surveys. Actual losses varied from a few dollars per year to as much as $724,400.00 for a 10-year period with gas at 7c per M. C. F., and interest compounded at 7% per annum. Further tests after repairs were made showed that this same loss could have been reduced to less than $100,000.00.

Tests will show when a line has served its usefulness, and that money might be saved by abandoning the line and reclaiming the pipe.

One principal cause of losses is the lack of appreciation of leakage through small holes. The Bureau's tests show that the value of gas lost in this manner at an average pressure of 300 pounds per square inch, varies from $173.00 to $41,630.00 per year for holes with diameters varying from 1/64 to ¼ of an inch.

It is recommended that all operators give serious study to the matter of leakage, by securing Serial No. 2735 from the Bureau of Mines and conducting tests on their own lines. Large line losses may be detected from the least suspected sources, by a systematic survey as outlined in this paper.

Indexing *and* Filing *of* Gas Engineering Data

Walter M. Berry and Grace Burnet Dixon of the California Gas Research Council present the following outline of the ground covered by their paper prepared for the Convention.

THE recording and filing of information in the average business office of today has been developed to a high degree of perfection, but the filing of technical data has not received the attention it deserves. This is perhaps due to a greater variety of requirements, which make standardization more difficult.

Walter M. Berry

A lively interest in industrial research has stimulated the use of technical libraries, and many large properties operate special libraries, with trained librarians in charge, for the benefit of their organizations. But even with this facility, the executive finds it necessary to maintain a technical file in his own office where he can have quick and convenient access to written data of particular use to him.

The engineering profession utilizes something of almost every branch of science and the mechanical trades, and this is indeed true of the gas engineer, whose chosen field necessitates a wide acquaintance with diversified technical data. The information of greatest value to the engineer is found in current periodic literature, pamphlets, reports, and similar printed matter; and the co-ordinating and making available for easy reference of this variety of technical information is not an easy matter.

The injudicious choice of a poor system of filing causes many an engineer to look upon the maintenance of a private technical file as something theoretically feasible but practically impossible, and for this reason he often deprives himself of the convenience of an up-to-date file that would prove an endless source of satisfaction to him in his work.

WHAT THE PAPER COVERS

The paper to be presented at the gas convention on Indexing and Filing of Gas Engineering Data calls attention to the essential characteristics of a satisfactory file for the engineer—such as simplicity, expansion, conformity with prevailing systems, and economy of use; and discusses the relative advantages and disadvantages of the Dewey Decimal, Numeric, and Alphabetic-subject methods of filing—the systems in most general use.

There is considerable space devoted to a discussion of the card index, which describes the straight alphabetic-subject index, with particular attention given to the selection of the important subject heading. A very complete list of subject headings is appended, not only to illustrate the suggested form of file, but to offer concrete assistance to engineers in planning files similar to that described.

There is also a section devoted to the subject of filing of catalogs.

The files of the California Gas Research Council contain varied and highly technical engineering data, and a description of a system of filing that takes care of the requirements of that organization will undoubtedly be of interest to engineers and gas-company executives.

Undistributed Costs Report

Following is the full report of the Committee on Undistributed Costs. The committee personnel is: E. N. Simmons, Los Angeles Gas and Electric Corp., chairman; H. T. Terry, Pacific Gas and Electric Co.; A. C. Johnston, Southern California Gas Co.; W. J. McCoy, Southern Counties Gas Co.; F. Guy Haines, Portland Gas and Coke Co.; J. F. Hawkins, Pacific Power and Light Co.; W. L. Fitzpatrick, Tacoma Gas and Fuel Co.; W. S. Cluff, Pacific Gas and Electric Co.

DUE to the wide divergence in the methods employed in the treatment of overheads by the 14 companies whose practices have been embodied in this report, "undistributed costs" have been construed as being synonymous with "overhead costs".

E. N. Simmons

The uniform systems of accounts in use in most states prescribe in effect that "so far as possible, overhead construction costs, such as engineering costs, law expenses, injuries and damages, taxes and interest during construction shall be assigned or apportioned to particular accounts, to the end that each item of property shall bear its proper share of such cost and that the entire cost of the item of property, both direct and overhead, may be deducted from the fixed capital accounts at the time the item of property is retired." While these classifications state that "where overhead construction costs pertain to the entire enterprise and cannot be assigned or apportioned", they may remain upon the books as undistributed construction expenditures, the interpretation by nearly every company is that, by some means or other, a distribution or an apportionment can be made.

In spite of the fact that the various account classifications go into more or less detail, there still seems to be some differences of opinion as to just where to draw the line between what should be considered a direct charge and what should be termed overhead. Most companies seem to favor the charging direct of all items that can be identified in any way with a job or account, thus reducing to a minimum the amount which must be distributed in accordance with some arbitrary plan.

DISTRIBUTION

The time of distribution and the methods employed vary. While several of the companies distribute annually to gross additions such items as engineering and superintendence, taxes and interest during construction, miscellaneous construction expenditures, etc., the practice of the majority is to either distribute such costs monthly or upon the completion of a job. The "annual" method is perhaps the simplest, and in all probability as nearly accurate as any, although under either of the latter plans there is the advantage of being able to give complete costs of a job within a very short time after its completion.

DISTRIBUTION TO LAND ACCOUNTS

There is no uniformity among the companies regarding the distribution of overhead to land accounts. Some companies do not add any overhead to land, others add certain items only (such as taxes and interest), while still others prorate overhead to land additions on the same basis as they do to other classes of capital.

It seems that a good plan would be to add to land accounts the proper portion of interest and taxes during construction and also a small additional amount to take care of the various overhead expenses in connection with land purchases.

"COST PLUS" TREATMENT VARIES

There are about as many practices for the treatment of undistributed costs in connection with large plant additions built on a "cost-plus" basis, where most of the engineering and supervision is handled by the contractor, as there are coast companies. The only point on which most of the companies agree is that the percentage of general overhead to be added should be somewhat less than that applied to jobs handled directly by the company's own construction department, for the reason that on "cost-plus" jobs the contractor includes as direct costs certain items which the company's engineering department ordinarily considers as overhead. It would seem that the minimum amount which should be added would be the proper proportion of taxes and interest during construction.

A plan in use by two of the companies, and the one which the committee feels is perhaps most equitable, is to add to such jobs a sufficient portion of the undistributed costs for the year to bring the total overhead up to that used in connection with other construction. This is accomplished in two different ways: In one case, by arriving at the percentage that the overhead portion of the "cost-plus" job bears to the direct cost portion and then increasing this by the amount necessary to make up the deficiency; in the other case, by first charging the overhead portion (estimated if not known) direct to undistributed costs and then using the balance as a direct cost item over which to prorate the same percentage of overhead as is applied to other jobs.

RATE-FIXING SCHEDULES

Very few companies seem interested in the working out of a plan for the uniform presentation of undistributed costs in connection with rate-fixing schedules, for the reason that they distribute their overhead in one form or another and, therefore, are not called upon to furnish separate statements of these costs. In most cases, it was felt that a continuation of the set-ups theretofore used by them would be more desirable.

RETIREMENTS

With the exception of one company which makes no attempt to write out overhead and another which does not write out interest during construction, the practice is to retire overhead on all items of property removed from service.

Several good methods are in use for making these write-outs. The first of the following plans is perhaps the most practical and efficient:

Where overhead is distributed over the several accounts, but not added to each individual job, the most popular method is to write out the same percentage of overhead as that experienced during the year the unit was installed. Some companies note these percentages on their inventory records in order that they may be immediately available at the time of making retirements. The same result can be accomplished by furnishing the men in charge of this work with a table showing the overhead percentages experienced during the various years.

In the event that overhead is added to each job at the time same is completed, thereby becoming a part of the cost of the job, it gets written out automatically when the unit of equipment is retired from service at cost.

An easier method is to let the retirement of overhead go until the end of the year, and then make one summary entry to take care of overhead on all write-outs made during the year. Under this plan the weighted average percentage of overhead should be used.

CONCLUSION

In conclusion, we find that the majority of companies favor the charging direct to all items that can be identified with a particular job or account, thus reducing to a minimum the amount which must be treated as overhead; the distribution of said overhead in accordance with some well-defined plan, either monthly or upon completion of the job over all tangible capital additions with smaller percentages to land accounts, and the final writing out of all such overhead when the item of capital is retired.

Committee *on* Prime Movers Submits Report

Below is printed a synopsis of the report of the Committee on Prime Movers, prepared by Chas. H. Wilcox, Los Angeles Gas and Electric Corp., chairman. E. H. Roseberry and D. C Murphy complete the committee.

THE object of this report being to collect data indicating the advantages of certain types of gas compressors for certain conditions, together with some idea of comparative operating costs, questionnaires were sent out and an attempt made to draw conclusions from the replies. Owing to the variable operating conditions as regards pressures and volumes, it was found difficult to collect information warranting definite conclusions. The report, therefore, is of a general character.

Chas. H. Wilcox

Compressors in general use may be grouped into four general classes, on a basis of discharge pressures, as follows:

Class A	60	to	125	lbs.	per	sq.	in.
Class B	15	to	60	"	"	"	"
Class C	3	to	15	"	"	"	"
Class D	0	to	3	"	"	"	"

It seems general practice to use two stage reciprocating compressors in the Class A range. This choice may be governed somewhat by load factor. So many variables enter into the calculating, it is difficult to show at just what point it is economical to go from single to two stage units. The advantages to be gained with two stage compressors are, less power required, lower temperatures, and higher volumetric efficiencies. The higher the pressure and the greater the volume, the more these advantages appear, and the point at which the gain warrants the increased cost of the units is the governing factor.

High temperatures may cause scale deposit in the jackets, or lubrication difficulties in the cylinders and valves, due to carbon deposits; also the higher temperatures are not desirable because they necessitate larger line capacity to carry the same

amount of gas that would be carried in a smaller line at lower temperature. However, if a plant has only peak loads over short periods, when it is necessary to compress to over 60 lbs., up to 75 lbs., or even 100 lbs. and the most of the time the pressure is, say 50 lbs., two staging may not show any advantages.

OPERATING COSTS OF LARGE UNITS

The greater number of plants fall in the 15 to 60 lbs. classification, in which it seems general to use single stage reciprocating compressors. The average cost of steam driven machines of this type is $45.00 per horse power. Operating costs of the larger units in this class were reported, as follows:

Attendance	$500 to	$7,000 per year, per unit
Supplies	500 to	1,000 per year, per unit
Maintenance	200 to	500 per year, per unit

Apparently the grouping of units has a large bearing on the attendance charge.

Operating costs of electric driven compressors in this class were reported, as follows:

Attendance	$1,000 to	$3,000 per year, per unit
Supplies	50 to	150 per year, per unit
Maintenance	100 to	400 per year, per unit

PRESSURE CONTROL

Pressure control on the electric units is obtained either by throttling the suction, or by unloading valves; or a combination of these methods. One builder furnishes a step unloader, with one unloading valve in each end of each cylinder, which, when open, allows the gas to by-pass back to the suction. The head end valves are manually operated; the crank end valves are automatically operated by the gas discharge pressure through a pilot valve. The pressure at which the automatic valve kicks out is regulated by a weighted lever arm on the pilot valve. One automatic is set to release at a slightly higher pressure than the other. All four unloading valves are opened when starting the compressors. When running, the load is adjusted with the hand unloaders and the automatics take care of any fluctuation.

Another builder furnishes a five step automatic unloader, having two unloading valves in each end of each cylinder. These valves are all controlled by the discharge gas pressure through a master pilot valve and when open allow the gas to escape into clearance pockets. These clearance pockets have a cushioning effect, which prevents excessive power fluctuations. The valves operate in pairs, one valve in the head end of one cylinder functioning with one valve in the crank end of the other cylinder.

Multiple stage centrifugal compressors have been built to operate in this pressure range, but, to our knowledge, none of these are in service on the Coast and no data are available on their operation. They are only adapted to handle large volumes, and due to the large number of stages require a long shaft between bearings, which makes them difficult to keep in balance.

In the C classification—3 to 15 lbs.—we find single stage reciprocating and positive displacement compressors of the figure eight type. Units of the latter type are made in a wide range of sizes and are adaptable to either steam or electric drive. Where large volumes are to be handled, the centrifugal compressor should be considered in this field.

Concerning the 0 to 3 lbs. range, we find the centrifugal type of compressor, in capacities of from 500,000 to 1,500,000 cubic feet, per hour, both in single and multi-stage units. This type of compressor has the advantage of simplicity, small floor space, low maintenance, steady delivery pressure and good steam economy when turbine driven. Volume control is obtained by throttling the discharge, or suction, by changing the speed, or a combination of these means.

SINGLE STAGE CENTRIFUGAL COMPRESSOR

The single stage centrifugal compressor is a cheaper, lighter weight unit than the multi-stage machine and runs at a higher speed. No operating troubles were reported with either type with clean gas. Suitable tar drains and steam out lines must be provided if tar is being carried with the gas. Attendance costs were reported from $500.00 to $6,000.00 per unit, per year, the discrepancy being due to location, rather than to the unit itself.

Considering all classes of reciprocating compressors, there are four general types of valves in use, feather, poppet, plate and corliss. Some builders use a combination of these types, i. e., corliss inlet with feather, plate or poppet discharge valves. The corliss valve gives better volumetric efficiency, but may give lurication trouble. The feather valves have to be renewed as often as once in six months, in one instance. In another case, the springs under the plate valves have to be renewed about as often.

FEW OPERATING TROUBLES

No serious operating troubles were reported. On large compressors where the weight of the piston is carried on the tail rod and proper attention given to lubrication and adjustment, it seems the life of the machine should be indefinite. Proper lubrication implies the use of a good quality of oil, as well as proper application.

Where a machine is operating continuously under the supervision of several operators, it is very possible for a valve adjustment to be changed. It is suggested that cards be taken twice a year to check the performance of each unit.

Centrifugal compressors need occasional bearing attention. If turbine driven, the governor should be kept clean and inspected to see that it is working freely. Maintenance should be very small.

The choice of drive for a compressor depends largely on its location. If situated at the gas works where steam is required in the manufacturing process, and where waste heat may be available for making steam, it can be economically operated as a steam unit.

STEAM CONSUMPTION

Steam consumption on the larger reciprocating units, operating with corliss or piston valves was reported from 12 to 15 lbs. per I.H.P., per hour, with 150 lbs. steam pressure and 26 inches of vacuum. One plant operating at 180 lbs. and 100° superheat, reports steam economy of 11.9 to 12.48 lbs. per I.H.P. per hour. The only uniflow engine reported uses from 16.5 to 17.8 lbs. per I.H.P., per hour, with 100 lbs. steam and 26 inches vacuum.

Many of the smaller units reported were electric driven. It does not seem good practice to rely entirely on electric drive at a central station, because of the possibility of a power outage.

In outlying booster stations, the investment in steam equipment and standby labor is not warranted. The unanimous choice is electric drive. In one instance, a comparative figure was given between electric, steam and diesel drive for a 300,000 cubic feet per hour compressor. The installation cost was in the following ratio—electric, 1; Steam, 2; diesel, 3.

In any station the load factor deserves important consideration and will govern the size of the units considered. Large units will probably cut the maintenance and operating labor costs, but they should not be so large that they have to be operated at partial loads over long periods. Where possible, duplicate units will reduce the necessary investment in spare parts.

Home Service Bureau Report

C. R. Miller, chairman of the Home Service Bureau, presents the following abstract of the Bureau's report:

THIS committee has undertaken the following studies:

First, to compile a digest of the existing practices in vogue with company members in servicing customers' installations.

C. R. Miller

Second, to study the volume of this work by the different companies, and if possible develop a cost per call and the overall cost per consumer.

Third, to investigate and report to the gas appliance dealers present practices and policies with respect to servicing gas appliances free, and within what time they would follow a sale.

Fourth, to determine the percentage of appliances for which service is asked, the common causes for such service, together with a study of the various organizations built up due to this work.

The progress of the committee has been reasonably good considering the circumstances under which such information must of necessity be obtained. The report offered this year will, however, amount to a progress report, with recommendations that the committee be continued for another year in order to accumulate more information, that they feel will better represent or reflect the existing policies, and that the committee may also have the advantages which will be gained from the discussion of this year's report at the time it is presented on the convention floor.

Report *on* Education *and* Training *of* Employees

Harry J. Smith, Pacific Gas and Electric Company, chairman of the Committee on Employees' Education and Training, has prepared the abstract of his committee's report published below. Membership of this committee is made up of Harry J. Smith, chairman; D. L. Scott, H. K. Griffin, H. H. Stuart, L. D. Dell, F. P. Boller, A. A. Salmon.

THE report gives the major gas companies on the Pacific Coast that are carrying on educational work for their employees, as well as what the Pacific Coast Gas Association, Gas Appliance Association of Southern California, American Gas Association, and the Chamber of Commerce of Washington, D. C. are doing in the advancement of education.

A short synopsis is given to explain each of the workings of the above mentioned companies and associations, as well as to recommend how the Pacific Coast Gas Association could make further progress by forming a well-defined educational committee that would have a definite aim for the stimu-

lating of education among the employees of all gas companies on the Pacific Coast and, with such a system, the educational work could not fail.

The report also points out seven suggestions for starting the material matter and although they might not be just the right prerequisites, they surely give a starting point to pivot around and it is positive that as each year passes, the effort will prove well worth while.

CENTRAL BUREAU NEEDED

All of the data accumulated is substantial proof that a Central Bureau, under the Pacific Coast Gas Association, should be organized.

The first step would be to organize a well-defined educational committee, so that a definite procedure could be followed, as without organization, educational work would be hopeless.

The committee offers the seven following suggestions for the commencement of such a plan.

1. The use of a question box through the Pacific Coast Gas Association.
2. Illustrated lectures through the Pacific Coast Gas Association.
3. Lecture courses written by the various gas companies and associations to be sent to the Pacific Coast Gas Association for publication.
4. Lectures given by various gas companies and associations to be sent to the Pacific Coast Gas Association in typewritten form.
5. Material gathered could then be used in the preparation of courses.
6. The Pacific Coast Gas Association to co-operate with American Gas Association and take advantage of their educational courses, which should function through the Committee organized for educational work.
7. The Pacific Coast Gas Association to co-operate with universities and take advantage of their educational courses, which should function through the Committee organized for educational work.

A definite system of this kind would, as years roll by, become very valuable to the gas industry.

Building Gas Consumption *Thru* Existing Services

J. Earl Jones of the Portland Gas and Coke Company will present a paper entitled, "Increasing Gas Consumption through Existing Services and Meters," and has given us the following abstract of his manuscript.

THE consumption of gas obviously depends upon the number of appliances connected to gas service and the extent to which those appliances are used. This discussion will therefore treat with those factors which affect the distribution of gas consuming appliances and their uses.

The use of gas in homes commonly involves lighting, cooking, water heating and house heating. It is generally conceded that where electricity is available, gas will only be used for lighting in residences to a limited extent by those customers who prefer gas lighting on account of its superior quality of light and for auxiliary lighting purposes.

HOUSE HEATING IMPORTANT

While the subject of increased gas consumption through existing services and meters necessarily includes gas heating as a very important factor, the subject is so broad that it will only be considered in this paper insofar as it relates to other uses of gas in the home.

It is believed that a choice of cooking service largely determines the customer's general use of gas in the home. This paper, therefore, will be confined principally to a discussion of increased gas consumption as it relates to cooking service.

It is assumed that every up-to-date gas company will furnish a high quality gas product. Public regulation will largely determine this although a successful gas company will go beyond the public service commission requirements toward improving its product.

SAFE APPLIANCES DEMANDED

The general use of standard gas appliances in homes is largely dependent upon the quality of the appliances in use. Obviously the first requisite for quality appliances is their design for the safety and health of the public. The Appliance Certification Plan now being sponsored by the American Gas Association and the Pacific Coast Gas Association is the first genuinely constructive movement to insure appliances which will guarantee the safety and health of the customers insofar as the use of gas service is concerned. The gas fraternity is quite within its rights and is duty bound to assist legislative bodies in providing code regulations and inspection service, which will prohibit the sale and use of any gas equipment which will endanger the health and safety of the public.

To encourage the use of more and better gas ranges, careful consideration must be given to distribution facilities. There may be a difference of opinion as to the advisability of the gas company selling appliances, in competition with other dealers. A gas company's policy in this respect would depend upon the activities of the dealers in the sale of appliances.

HELPING THE DEALERS

Whether the gas company engages in the sale of appliances or not, its new business policy should make it possible for all dealers in gas equipment to operate successfully in the sale and distribution of good gas equipment. A gas company can do a great deal toward helping other dealers in their appliance sales. Free gas company service in adjusting other dealers' appliances invites active dealer distribution.

Working through architects, builders, plumber dealers, etc., will aid materially in the larger use of good gas equipment. It is important to furnish these trade elements with complete information on gas service in convenient form.

Too much attention cannot be given the condition of gas equipment now in use. An analysis of a representative list of discontinued services was made with the following results:

WHY GAS USERS DISCONTINUE

Seventy customers gave notice to discontinue service because:

Appliances inadequate account too small, wornout or obsolete, 30; poor ventilating facilities, 4; changed interior arrangements, 6; not using appliances enough to justify, 20; decided to try electric ranges, 12; preferred electric water heaters account monthly flat rate, 5; preferred wood range, 2; afraid of gas, 1.

It is interesting to note that 10 customers discontinued gas service because they were only using it for auxiliary purposes and considered the minimum monthly charges too high. This indicates the danger of losing customers, who are not sold to the idea of making more use of their gas equipment.

(Continued on page 82)

Committee *on* Load Factors

This synopsis of the report of the Committee on Load Factors was prepared by W. M. Henderson of the Los Angeles Gas and Electric Corporation, chairman of the committee. Other committeemen are: C. G. Fiscus, Otto Goldkamp, V. W. Harper, J. E. Kelly, W. F. Pape, R. V. Wilson, S. C. Singer, L. L. Biggs, R. C. Boughton, A. R. Bailey.

THE study of distribution load characteristics is for the purpose of setting up values for the factors that influence distribution design, service pressure and capital investment.

The factors upon which values were secured included individual consumers' demands over periods of winter months; extent of diversity in use of gas existing for groups of consumers; relation between maximum demand for gas and capacity of appliances; use of gas per consumer for groups at periods of maximum demand.

W. M. Henderson

All data collected were gathered by committee members working in different communities on the Pacific Coast. The survey was carried on during the winter months, or periods of maximum demand for 1925 and 1926. Data were gathered by the use of demand meters with volume recorders or orifice meters, recording gas served to groups, and the clock recording meter set on individual consumers' premises.

TABLES ACCOMPANY REPORT

The results obtained covered a record of 1,526 consumers including 20 groups. From the data calculations were made to obtain the values for the various factors and these are set up in tables for convenience.

Unfortunately the past winter was rather mild and peak hour demands did not reach the expected maximums. To this extent the data are limited and definite conclusions cannot safely be drawn. However, there is much of value in the tables. The value of diversity is indicated; this factor is the key to distribution design. Load factors, or the percentage of capacity that is actually used, are set forth. All the results are of interest, but to be of real value it will require another year of investigation in order to substantiate the figures.

DEFINITIONS NEEDED

The report is submitted with the hope that there will be general discussion. Interest is particularly centered on suitable definitions, and accepted meaning for such terms as:

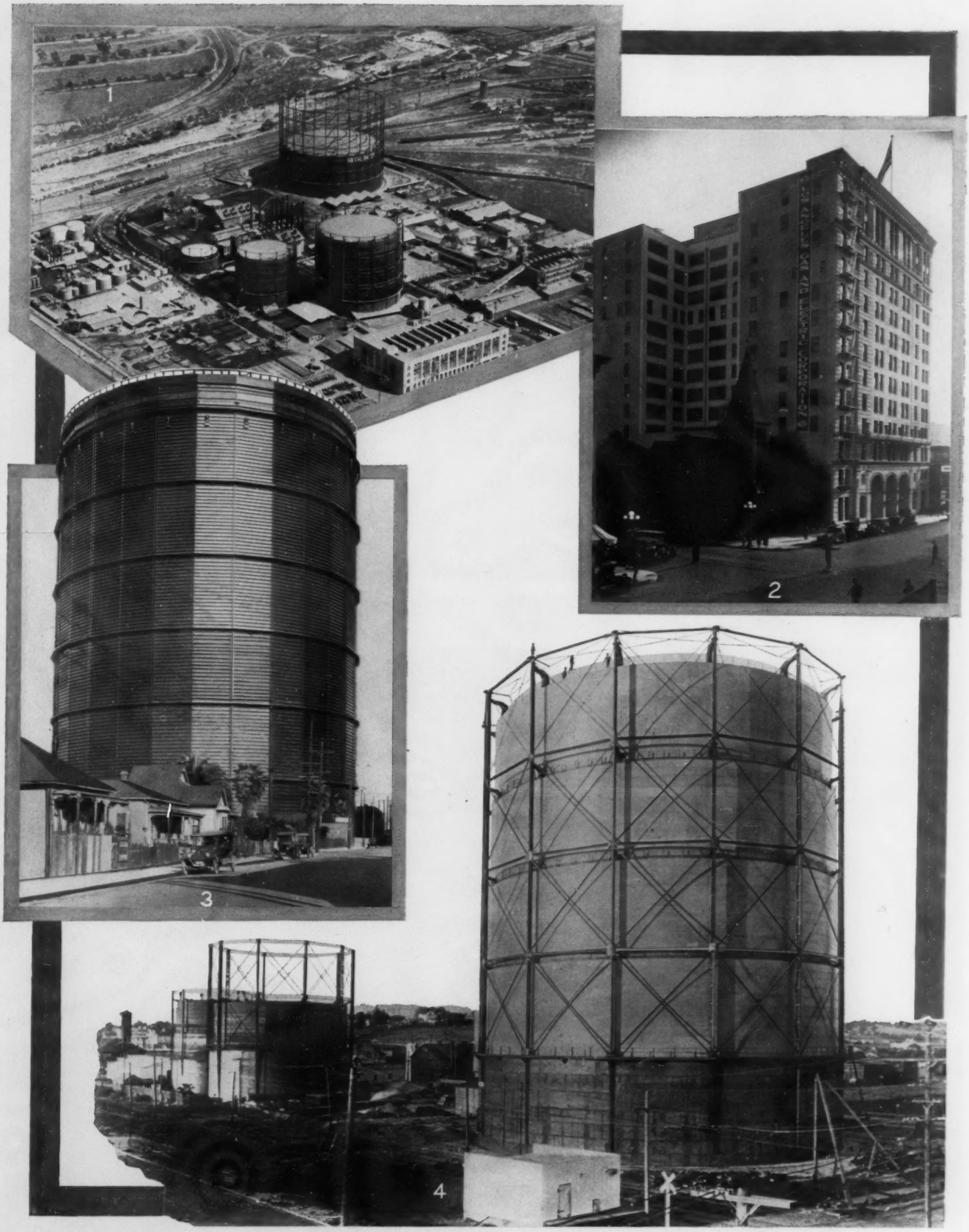
Connected load of appliances.
Demand
Maximum demand
Non-coincident demand
Coincident demand
Diversity Factor
Load Factor

Experience is also desired on other subjects of interest in connection with the study, such as:

Best type of recording meters to use for metering gas to individuals or to groups.

What is the general practice in selecting a meter or service size; what relation has capacity to demand of consumer?

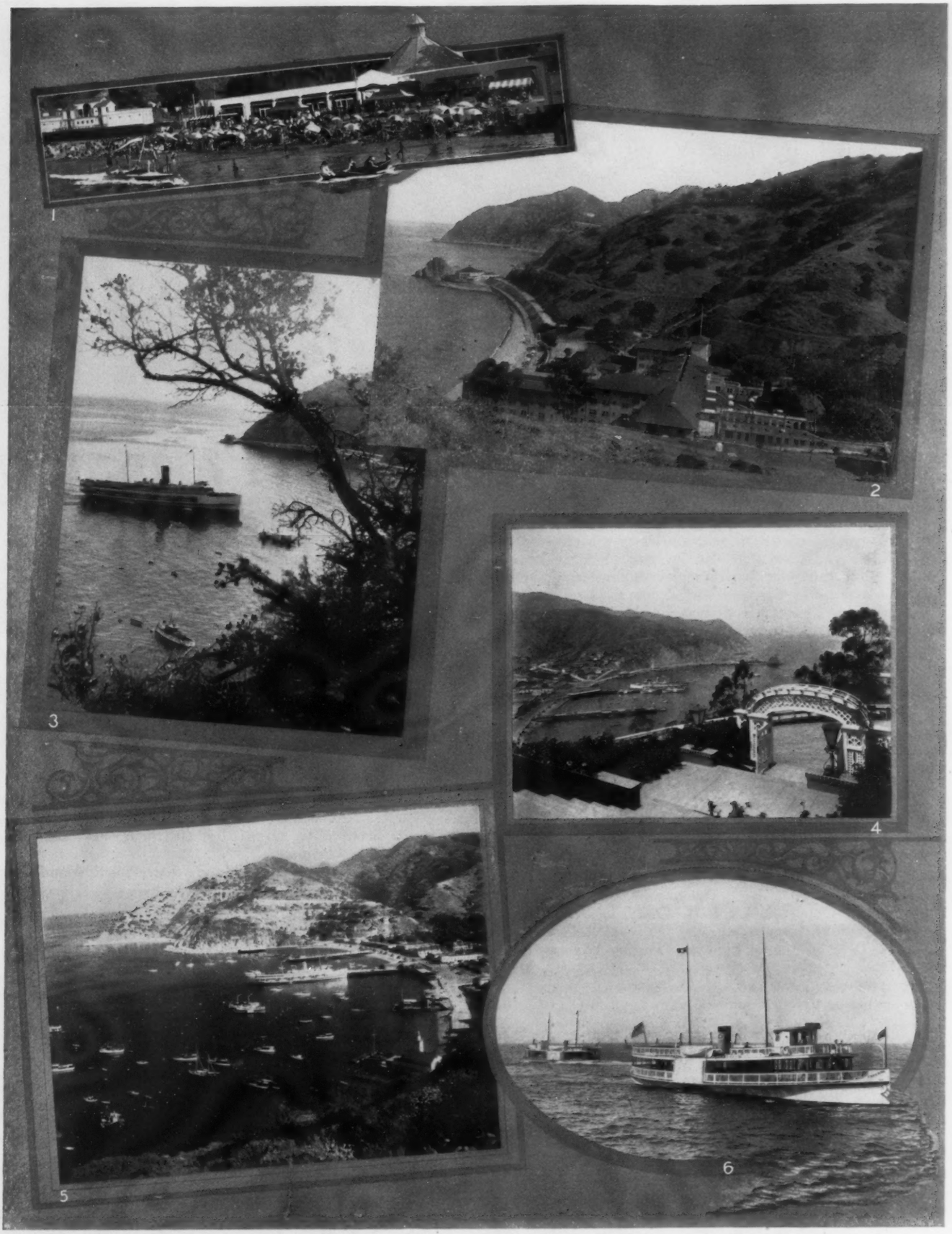
Upon what basis are pipe sizes selected for gas mains?



SOME OF SOUTHERN CALIFORNIA'S GAS PROPERTIES: (1) SO. CAL. GAS CO.'S PLANT AT LOS ANGELES. (2) HOME OF L. A. G. & E. AND SOUTHERN COUNTIES GAS CO. (3) L. A. G. & E.'S 15,000,000 CU. FT. GAS HOLDER. (4) VENICE PLANT OF THE SO. COUNTIES GAS CO.

ARROYO SECO AND PASADENA ROSE BOWL STADIUM—FOREGROUND, BROOKSIDE PARK

A GLIMPSE OF THE BUSCH PUBLIC GARDENS—FAMOUS SCENIC SPOT IN PASADENA



TYPICAL SCENES AT CATALINA ISLAND: (1) ON THE BEACH AT AVALON. (2) THE HOTEL ST. CATHERINE. (3) A STEAMER ENTERING AVALON HARBOR. (4) THE HARBOR, FROM THE WRIGLEY RESIDENCE. (5) PLEASURE CRAFT AT AVALON. (6) TWO GLASS BOTTOM BOATS

Announcing the Complete Program of

SINCE last-minute changes are bound to occur in the day-by-day Convention program we give here only the features which are scheduled for general and sectional sessions, with names of speakers and committee chairmen who will appear on the Convention floor. Details of entertainment for Convention delegates and visitors are given on another page of this issue.

General Program

Address of Welcome: *S. B. Cole,* Chairman Pasadena City Board of Directors.

President's address: *F. J. Schafer,* General Manager, Southern California Gas Co.

Secretary's report: *Clifford Johnstone,* Executive-Secretary.

Communications.

Election of Officers.

New Business.

Address, "The Future": *A. B. Macbeth,* Executive Vice-President, Southern California Gas Company and Nominee for President of American Gas Association.

Address, "The Ladies": *C. H. Dickey,* president, Pacific Meter Works.

Address, "An Opportunity": *L. S. Ready,* Chief Engineer, Calif. Railroad Commission.

Address, "Blue Star Sales Plan and Testing Laboratory of the American Gas Association": *J. W. West, Jr.,* Field Representative, American Gas Association.

Paper entitled, "Gas Company Merchandising": *C. B. Babcock,* C. B. Babcock Company.

Paper entitled, "Tripartite Form of Gas Rate Schedule": *Rudolph Jenny,* Pacific Gas and Electric Company.

Accounting Section Program

A. E. Peat, General Chairman
Southern California Gas Company

Committee Reports:

Bonus, Premium, and Group Insurance: *Donald E. Buyers,* chairman, Portland Gas and Coke Company.

Undistributed Costs: *E. N. Simmons,* chairman, Los Angeles Gas and Electric Corporation.

Cost Accounting: *P. S. Booth,* chairman, Pacific Gas and Electric Company.

Customers Bookkeeping: *Wm. Evans,* chairman, Pacific Gas and Electric Company.

Statistics: *W. A. Worthington,* chairman, Pacific Gas and Electric Company.

Credits and Collections: *M. W. Thernes,* chairman, Spokane Gas and Fuel Company.

Paper on Stores Accounting Systems: *A. E. Peat,* Southern California Gas Company.

Commercial Section Program

C. M. Grow, General Chairman
Southern California Gas Company

Committee Reports:

Industrial Sales: *F. M. Banks,* chairman, Southern California Gas Company.

Appliance Sales: *F. U. Naylor,* chairman, Pacific Gas and Electric Company.

Refrigeration: *J. H. Gumz,* chairman, Pacific Gas and Electric Company.

Home Service: *C. R. Miller,* chairman, Portland Gas and Coke Company.

Customers Service: *C. R. Miller,* chairman, Portland Gas and Coke Company.

Advertising: *Clyde Potter,* chairman, Southern Counties Gas Company.

Papers Entitled:

"How to sell a High Class Article at a Profit": *Fred Forrest,* Forest Stove Works.

"Increasing Gas Consumption through Existing Services": *J. Earl Jones,* Portland Gas and Coke Company.

"The Genus Blah": *D. L. Scott,* Los Angeles Gas and Electric Corporation.

"Insulation of Houses to be Heated with Gas": *Wm. L. Hoyt,* American Gas Products Corporation.

"Gas Company Tie-in with National Advertising": *W. S. Woodbridge,* Bryant Heater and Manufacturing Company.

"Starting Right in the Use of Gas": *R. W. Campbell,* Southern California Gas Company.

Public Relations Section Program

W. H. Barton, General Chairman
Portland Gas and Coke Company

Committee Reports:

Transactions with Customers: *J. G. Bourus,* chairman,

the 33rd Annual Convention Sessions

Tacoma Gas and Fuel Company.

Report on Legislation and Taxation: *Geo. L. Myers,* chairman, Pacific Power and Light Company.

Customer Ownership: *F. E. Seaver,* chairman, Los Angeles Gas and Electric Corporation.

Relations with Educational Institutions: *L. M. Klauber,* chairman, San Diego Consolidated Gas and Electric Company.

Employees Education and Training: *H. J. Smith,* chairman, Pacific Gas and Electric Company.

Company and Employee Relationship: *E. G. McCann,* chairman, Pacific Gas and Electric Company.

Public Information: *R. E. Fisher,* chairman, Pacific Gas and Electric Company.

Technical Section Program

Frank Wills, General Chairman

Pacific Gas and Electric Company

Distribution Bureau: *R. M. McCalley,* chairman, Portland Gas and Coke Company.

Load Factors: *W. M. Henderson,* chairman, Los Angeles Gas and Electric Corporation.

Unaccounted for Gas: *B. G. Williams,* chairman, Los Angeles Gas and Electric Corporation.

Materials: *D. H. Perkins,* chairman, San Diego Consolidated Gas and Electric Company.

Maps and Records: *R. E. Cole,* chairman, Portland Gas and Coke Company.

Pipe Protection: *S. H. Graf,* chairman, Oregon State Agricultural College.

Natural Gas Bureau: *H. P. George,* chairman, Midway Gas Company.

Compression: *Elting Henderson,* chairman, Midway Gas Company.

Measurement: *Ralph L. Cook,* chairman, Midway Gas Company.

Safety Bureau: *V. R. Hughes,* chairman, Pacific Gas and Electric Company.

Meter Bureau: *E. A. McCallum,* chairman, Pacific Gas and Electric Company.

Statistics: *D. E. Farmer,* chairman, Portland Gas and Coke Company.

Shop Procedure: *F. H. Coble,* chairman, Southern California Gas Company.

Purification Bureau: *J. M. Dickey,* chairman, Pacific Gas and Electric Company.

Tar Analysis: *S. C. Schwarz,* Portland Gas and Coke Company.

Oxide Purification: *F. C. Jones,* chairman, Pacific Gas and Electric Company.

Liquid Purification: *Kenneth N. Cundall,* chairman, Pacific Gas and Electric Company.

Manufacturing Process Bureau: *F. J. Gartland,* chairman, Public Service Co. of Colo.

Approaching the Ideal Gas Manufacturing Process: *Geo. Wehrle,* Public Service Company of Colo.

Water Gas: *F. C. Hawks,* chairman, Tacoma Gas and Fuel Company.

Steam Production Bureau: *C. M. Cole,* chairman, Southern California Gas Company.

Prime Movers: *C. H. Wilcox,* chairman, Los Angeles Gas and Electric Corporation.

Transportation Bureau: *H. W. Drake,* chairman, Portland Gas and Coke Company.

California Gas Research Council Papers: "Combustion Charts for California Gases": *F. A. Hough,* Southern Counties Gas Company.

"Results of More Complete Atomization of Oil in Oil Gas Manufacture": *J. E. Kelley,* Western States Gas and Electric Company.

"Indexing and Filing of Gas Engineering Data": *W. M. Berry* and *Grace B. Dixon,* California Gas Research Council.

"Tests of super-refractories in Oil Gas Generators": *H. J. Knollman,* Los Angeles Gas and Electric Corporation.

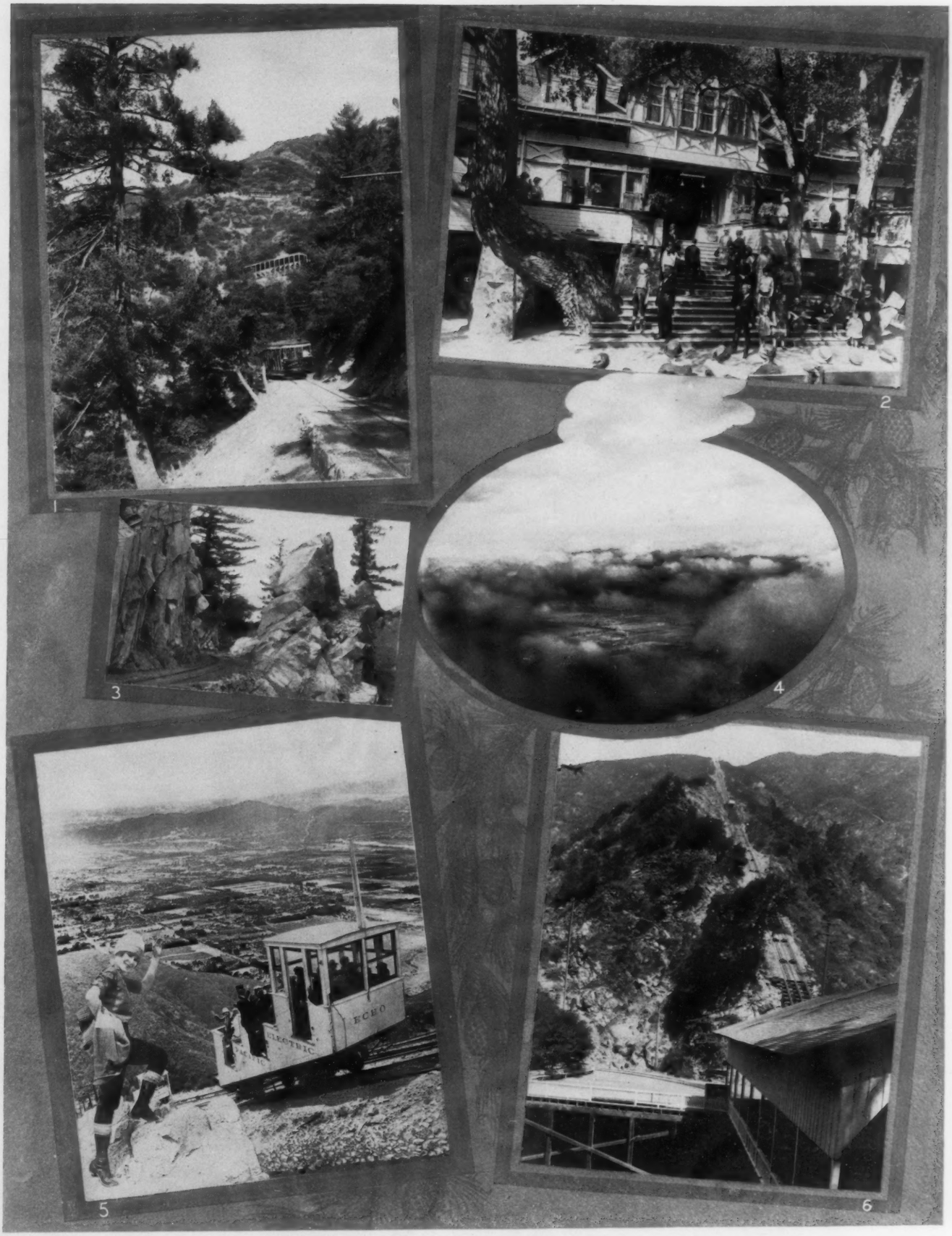
"Coal Suitable for Gas Manufacture in California": *W. W. Odell,* U. S. Bureau of Mines.

"Factors in Prolonging the Life of Buried Pipe": *H. S. Christopher,* Southern California Gas Company.

"Effects of Oxygen and Water Vapor in Accelerating Interior Corrosion of Gas Mains": *J. A. Harritt,* San Diego Consolidated Gas and Electric Company.

ANNANDALE GOLF CLUB, PASADENA, WHERE ALL GOLF TOURNEYS WILL BE PLAYED

PASADENA IS NOTED FOR BEAUTIFUL STREETS—S. ORANGE GROVE AND MARKHAM



SCENIC MT. LOWE: (1) ON THE RUGGED TRAIL TO MT. LOWE TAVERN. (2) MT. LOWE TAVERN. (3) GRANITE GATE. (4) ABOVE THE CLOUDS AT INSPIRATION POINT. (5) TO THE TOP BY CABLE CAR. (6) A CLEAR VIEW OF THE INCLINE RAILWAY FROM RUBIO STATION

LOS ANGELES, SEEN FROM THE AIR—EXPOSITION PARK APPEARS IN THE FOREGROUND
THE CITY IS ONLY A FEW MINUTES DISTANT FROM P.C.G.A. CONVENTION HEADQUARTERS

Report *on* Unaccounted-*for* Gas *Is* Made

B. G. Williams of the Southern California Gas Company, chairman of the Committee on Unaccounted-for Gas, has made the following abstract of that committee's report. Other committee members are: J. R. McLaughlin, D. H. Perkins, F. O. Suffron, W. F. Tyler, R. V. Wilson.

UNACCOUNTED-FOR gas is the term applied to the shrinkage in measurement between the total amount of gas produced and the amount sold.

The sendout of the principal gas companies on the Pacific Coast during 1924 approximated 90,000,000,000 cu. ft. The corresponding amount of "Unaccounted-for" approximated 7,250,000,000 cu. ft., which represents slightly over 8 per cent of the sendout. The value of this "unaccounted-for" at a holder cost of 30 cents per thousand cu ft. is $2,167,642.00.

This year's committee was given the work of reporting on four phases of the problem, viz.:

1. Analysis of the "unaccounted-for" of member companies according to contributing causes.
2. Standard method of expressing "unaccounted-for" figures.
3. Cost of leakage and the financial benefit resulting from elimination operations.
4. The relationship between the various standards of construction and subsequent leakage.

An extensive questionnaire, designed to secure detailed information on the contributing causes of leakage as well as the cost and financial benefits of leakage elimination operations, was sent out to all of the larger member companies.

It is obvious that the usual method of expressing "unaccounted-for" as a percentage of the sendout serves to indicate the effect of such losses on the unit cost of distributing gas.

The expression "per cent of sendout" does not however, disclose the physical condition of the underground system. Several member companies selling large quantities of gas wholesale report low percentages which are unquestionably affected by this volume, and are not therefore directly comparable with the figures of other companies.

It is not the experience of member companies that leakage is in proportion to the surface area. It has been found to bear a closer relationship to the number of joints. This experience may not entirely cover all cases, particularly where soil conditions are conducive to rapid corrosion; but judging from the comments made, the general condition on the Pacific Coast would seem to be at variance with the theory that the leakage is proportional to the surface area.

The recent elimination activity seems to indicate that for the most part leakage is due to defects in the joints.

PROPOSE STANDARD EXPRESSION

The committee proposes, as a standard expression for comparison between member companies, the use of the unit "cubic feet per mile per year" the linear length to be based on the actual net mileage of pipe in use, including services regardless of diameter.

This method will, the committee feels, give the most accurate relative index to the physical condition of the various systems.

We have attempted to compare the value of the leakage eliminated with the cost of elimination and to show the benefits of a persistent leakage elimination activity.

The data for this purpose were taken from the answers to the questionnaires to which four of the larger companies reported in considerable detail.

In 1925 approximately $135,000.00 was spent by the Southern California Gas Company on maintenance costs and the value of "unaccounted-for" was $302,000.00. There is a possibility that considerable additional work on maintenance would have decreased the unaccounted-for gas sufficiently to justify the additional cost.

It does not follow however that a continually increased cost of maintenance will result in a corresponding decrease in the value of unaccounted-for gas.

There is a twilight zone in which the amount spent on maintenance does not result in a saving in the value of unaccounted-for gas of sufficient size to warrant the expenditure necessary.

The report of the 1924 committee emphasized the importance of using proper leak-proof materials and methods by saying in part:

"With respect to the best means of reducing the actual leakage from underground pipes to a minimum, we believe the establishment and use of proper construction standards to be the most profitable line of endeavor.

Generally speaking we may say that our "unaccounted-for" situation is in a large measure the result of "holes" in our distribution and transmission systems. Actual leakage can be elinimated or at least controlled by the elimination of these "holes.' These "holes" are however, of two kinds, i. e., those occurring progressively in existing structures, and those left during the installation of new work.

RECOMMENDATIONS

This year's committee, as well as former committees, has been seriously handicapped by the lack of information which would permit the various member companies to segregate their actual loss according to contributing causes of leakage.

If this information can be made available this committee can, with a reasonable amount of effort, present an analysis of the "unaccounted-for" problem to the fraternity. Without such data however little relative progress can be made from year to year.

The committee therefore makes the following recommendations:

1. That the member companies all establish ways and means of securing information on the amount of leakage chargeable to each contributing cause.
2. That accounting procedure be provided in order to record the cost and benefits of leakage elimination activity, as well as the nature of defects and other important details disclosed by such work.
3. That a complete interchange of experience on "unaccounted-for" matters be secured among the member companies.
4. That the expression "per cent of sendout" be used only as a means of interpreting "unaccounted-for" in terms of unit cost, and; That the use of the unit expression "cubic feet per mile per year" based on actual linear length including services; without correction for diameter or other variations be used as a base for comparing the physical condition of various systems.
5. That the need of securing leak-proof standards of construction which do not depend primarily upon the proficiency of the workmen be emphasized.
6. That this committee be continued to act as a clearing house for the dissemination of this information, as well as to cooperate with other committees to the end of securing better standards of construction.

Report *of* Committee *on* Gas Meter Statistics

The report of the Committee on Gas Meter Statistics consists of the following material and a number of tables and charts which do not appear here. Committee membership is: D. E. Farmer, Portland Gas and Coke Co., chairman; J. E. C. Currens, Western States Gas and Electric Co.; Hartwig Barnes, San Diego Consolidated Gas and Electric Co.; and Oscar Cooke, Los Angeles Gas and Electric Corp.

THE committee on Gas Meter Statistics last year secured meter performance data from the majority of the large, and some of the smaller, Pacific Coast Gas Association member companies. This information was compiled in comparative report form, and the tabulations proved to be both illuminating and instructive. In view of the general interest shown in this report, it was deemed desirable that the work be continued, with the thought in mind that not only would each year's work be of value from a comparative standpoint, but that the information accumulated from year to year would trace the benefits derived from developments and improvements in the handling of the meter traffic of any company or group of companies.

D. E. Farmer

While the forms on which data was received last year were in general satisfactory, it was found that many of the company records did not include all the detail provided for therein. For this reason, it was thought advisable to modify the form to a point where it would be more in keeping with the information we might reasonably expect from the largest majority of the contributing companies, without sacrificing any of the more essential information. It is recommended that the member companies adopt or work out record-keeping systems that will in the final analysis provide such data as is asked for on the forms used this year. The Committee does not imply that this form is sufficient in itself to direct and govern meter traffic policies. Further detail will undoubtedly be necessary to adequately analyse the individual meter conditions. We do feel, however, that it provides the busy executive with a comprehensive birds-eye view of the general meter situation, and will point out wherein the meter operation may be better or worse than that which might be considered satisfactory, and will show at a glance those factors which merit further or special consideration.

We secured data under the following groupings:

1. All meters,
2. All iron meters,
3. Three-light tin meters,
4. Five light tin meters,
5. Meters over five-light size.

The replies from various companies on their 1925 meter performance have been segregated as follows:

1. Comparative tabulations showing test results on *all* meters.
2. Comparative graphs, showing percentages of meters testing within 2% fast and 2% slow, those over 2% fast, over 2% slow, and D. R. or non-registering.

3. Reports as received from the various companies showing comparative performance of the several sizes and types of meters.

Companies reporting were given the same code letter as was assigned last year, so that while the individual identities are not revealed, the accumulated yearly reports will carry uniform reference letters.

COMMON TEST STANDARDS NEEDED

Through the medium of a questionnaire sent out last year, it was revealed that the conditions under which meters were tested were at wide variance throughout the companies reporting. It was considered that an effort should be made to bring the test practices of the member companies to a common basis acceptable to all, so that results would be more truly comparable. With this in mind, the following conditions were given special consideration:

a. Pressure thrown in prover bells during tests.
b. Rate of flow during test.
c. Interpretation of the term "D. R."

It was found that pressures thrown in provers varied from 1½ inches water column to 2.8 inches. After numerous tests, and considerable discussion of the matter, it is our belief that in actual routine testing the theoretical difference between tests run at the above stated limits is so small that it is practically impossible to read it on a prover scale. However, when calibrating test cap orifices, it is highly desirable that a standard pressure be adopted. In view of the fact that 1½ inches pressure is used by the greater number of the companies at present, and that this pressure is better suited to the mechanical operation of the proving equipment than a higher figure, it is our recommendation that this figure be generally adopted as standard.

RATE OF FLOW DURING TEST

In considering the matter of rate of flow during test, it is our contention that the conditions under which the meter is tested should approximate as nearly as possible the actual conditions while in field service. While it would be highly impracticable, or even impossible, to apply this rule to the individual meter, the average condition under which a meter of given size could normally be expected to operate should be accepted as a standard. This being true, it then became necessary to make actual tests and observations to determine the average normal demand on each size of meter. At the same time, comments and suggestions along this line were invited from several of the larger companies. Information we have assembled at this writing is incomplete, and we are not prepared to make definite recommendations at this time. We do feel, however, that the subject is of sufficient importance to warrant continuance of the investigation, to the end that well-grounded standards may be worked out and presented for consideration. In this connection, attention is directed to the test cap table as set out in the American Gas Association proceedings of 1920, and republished in the Gas Service Bulletin of California. This table has been quite generally adopted throughout the country, and is in use by many of the California companies.

The foregoing recommended standards may or may not be scientifically correct, but they do represent what the majority of the member companies, in the light of present knowledge, consider to be in keeping with the best practice. It may well be that the work of other committees, particularly that dealing with "Unaccounted For Gas," will show that testing room methods have a very important bearing on the "Unaccounted For" situation, and that in so doing may prove the necessity for material changes in the present accepted standards. It should be borne in mind that, while a slight error in testing or proving may be negligible insofar as the individual meter is concerned, when it is applied to all the meters in service, and then considered over the period of a year's operation, the accumulative monetary loss becomes a matter of prime importance.

INTERPRETING "D. R."

In attempting to interpret the term "D. R." consideration must be given to two factors; namely, normal demand on the meter, and the causes contributing to the non-registering condition. It is seldom that a meter is called upon to deliver gas at a rate approaching its maximum capacity, and if such is the case, usually only for a relatively short period of time. To use the full flow or "open" test as a basis for reporting test results would then be giving a false reflection of the operation of a meter under usual service conditions. It follows, therefore, that in defining a meter as "D. R." the result of the check flow test should be used. Failure to register can in the majority of cases be traced to deteriorated diaphragms or "kicked-up" valve covers. It is possible that a meter having either of these defects might show a test of only 25% slow on the full-flow test, while in all probability it would be totally "D. R." under average service demands. It is our recommendation, therefore, that a "D. R." meter be defined as one which shows no registration under standard check-flow test, and that this classification be adopted in meter test findings reported in the member companies.

Report *on* Bonus, Premium and Group Insurance

Donald E. Buyers of the Portland Gas and Coke Company, chairman of the Committee on Bonus, Premium and Group Insurance, has abstracted the committee's report as follows:

THIS committee is a new one in the Association and the Association has heretofore done no work along the lines suggested for the committee.

Activity has been confined to collection of information about the practice of company members in the relation to bonus, premium, and group insurance.

Donald E. Buyers

Questionnaires were prepared on each of these three subjects and sent to 33 company members.

Replies were received from 25 company members.

Only three companies pay bonus. Only one company pays premium. All four of these companies reported benefit from such payments, in lower costs and less labor turnover.

Those paying bonus include only executive and office workers in those eligible. That company paying premium includes only foremen and dayworkers in those eligible.

Fourteen companies had insurance other than compensation. Ten companies paid the entire cost.

Six companies had mutual benefit organizations of employees to which these companies rendered assistance. Accident and life insurance predominated in the benefits provided for by these associations. A number included disability and others social and educational activities.

One association provided financial aid to members in emergencies.

CONCLUSIONS

The Association as a whole has little or no information nor has it done much of any work along the lines of bonus or premium, both of which have been live subjects with managers in other industries and parts of the country for a generation.

The necessity for insurance of some sort is recognized quite generally over the whole territory covered by company members. This is, no doubt, due to the publicity given to it by various legislatures and through this medium it has been thrust upon members of the Association sooner than they would have considered it of their own accord.

In view of the wide spread work done along these lines by other industries and most of the large corporations of the country, it seems that this Association on the whole is lagging far behind in these phases of modern management.

The American Management Association has tapped many sources in all lines of management and has compiled a large amount of accurate information which is available to management everywhere.

Compressor Committee

This abstract of the Compressor Committee, Natural Gas Bureau, was prepared by A. B. Newby of the Midway Gas Company, who is a member of the committee. Complete membership is as follows: E. Henderson, superintendent, southern division, Midway Gas Company, chairman; J. B. Gill, natural gas engineer; T. C. Wallace, Southern Counties Gas Co.; A. B. Newby, Midway Gas Co. H. P. George, general superintendent of the Midway Gas Co., is chairman of the Natural Gas Bureau.

A STUDY of gas engine powered compressor stations reveals a wide variation in design, construction, and operating detail. With the possibility of improvement in design and operation in mind, the committee has prepared a report outlining what it considers to be best practice in compressor station work.

The purpose for which the plant is built and the source of the gas supply are the determining factors in the selection of the size of the units to be used. For large compressor stations of a permanent nature, the large units of 1000 H.P. are preferred on account of their more economical operating cost per horsepower hour. For small field stations that are short lived, the smaller units of 200 H.P. and less are preferred on account of their flexibility.

UNIT SYSTEM RECOMMENDED

Regardless of the size of plant or the size of the units used, unit construction should be followed throughout the station. By unit construction is meant one compressor, one bay of building, one set of control valves, and one gas and water cooling unit so designed and erected that an entire unit may be taken out of service and moved without affecting the operation of the remaining units. The single exception to this unit construction is the closed system water pump. It is desirable to have a common pump on the closed system water, so that water circulation can be maintained through the engine when it is not running. In almost every case, a closed system on engine cooling water is recommended. Even if the

water does not contain sufficient scale forming solids to form scale in the water jackets, the closed system will allow a more efficient operating temperature on the cooling water.

The building should be of steel frame construction, covered with corrugated iron, well lighted, and ventilated. All valves on intake and discharge lines as well as compressor control valves should be of the outside rising stem type, so that it can readily be determined whether they are open or closed. These valves should be located outside the plant and readily accessible.

Valves about a plant should be painted distinctive colors to indicate the services for which they were installed. Having in mind the shifting of labor from one plant to another and realizing the importance of recognizing instantly the function of the various valves, the committee feels that these color schemes should be standardized.

RIGID INSPECTION ESSENTIAL

A rigid routine of inspection of equipment at stated intervals should be insisted upon. As part of this routine, the engineer on duty should make hourly entries in the daily log giving the various pressures, temperatures, engines running, etc. In addition to this the daily log should show the amount of oil used, engine repairs in detail and any unusual operating condition that might arise.

From the daily log the plant foreman should make out an individual engine log and a weekly or monthly report for the superintendent or main office. The engine log should be of such a nature and in such a form that it gives a complete and concise history of the unit. The weekly or monthly report should be a summary of the plant operation and giving total gas compressed, total fuel gas, total water purchased, oil used, engine hours, etc.

Gas engine manufacturers are constantly at work to improve the operation of their unit. However, with the gas engine in its present stage of development, a gas engine driven compressor station correctly designed and intelligently operated may be expected to function 99½% of operating time over a period of several years.

Relations Between Company *and* Employee

Eugene G. McCann, as chairman of the Committee on Company and Employee Relations, has prepared the abstract published herewith. Other members of the committee are: O. L. Moore, Los Angeles Gas and Electric Corp.; J. C. Gilbert, Southern Counties Gas Company; C. R. Johnson, Portland Gas and Coke Company; Norwood W. Brockett, Puget Sound Power & Light Company; R. G. Arthur, Douglas Gas Corporation; L. H. Stratford, Pocatello Gas & Power Company.

THE Committee on Company and Employee Relations was asked to study the various incentives provided by different companies to insure the loyalty and efficiency of their employees and to encourage them to respond to the service ideals of public utilities. Information was secured from 13 representative coast utilities covering the following general points:

1. Methods of employment, promotion, and recognition of service.
2. Health and safety measures.
3. Opportunities for training and education provided.
4. Methods of preserving the personal contact with employees.
5. Thrift plans.
6. Systems of encouraging and rewarding suggestions.

To begin with, the problem of employment and employee contact will vary with the size of the organization and the extent of territory served. Bearing this fact in mind it was found that there was a decided trend toward centralization of control of these activities. More than half of the reporting companies have a centralized or partially centralized employment service. It is interesting to note, however, that only four of these carry the centralization beyond employment to promotion and transfer service and all of these four have a specialized industrial relations or personnel department. Where these departments exist there is also direct evidence of their activities in the form of standard salary adjustment plans and a definite court of appeal in case of grievances.

TYPICAL EMPLOYEE ACTIVITIES

Six large companies report a system of awarding service badges. Definite pension plans are in effect in three of the largest companies and contemplated in two others. There is considerable evidence of attempts to hold the personal contact through employees' clubs, mutual benefit associations, etc. In two large companies fully organized employee associations are given a voice in all welfare policies. Several companies are considering them and several are lending support to athletic and recreational activities.

The majority of companies have definite safety organizations but centralization of safety activities is not universal. Only half of the companies require a medical examination at the time of employment. Medical service is nowhere carried beyond accident first-aid.

Eleven companies report definite plans of stock sales to employees, seven companies have definite group insurance plans and two companies have sickness and disability plans organized and supported by the employees themselves. Loans are universally discouraged although granted by several companies in cases of unusual emergency. Reduced rates on service and appliances are granted by the majority. Some allow merchandise purchases at company cost. There appears to be no evidence of any definite co-operative purchasing plan.

Suggestion systems seem to have met with little success. Several companies seem to have provided no incentive in the way of an immediate reward but on the other hand another company has temporarily abandoned an extensive system with monthly prize awards because of deterioration in the quality of suggestions.

WHAT DESIRABLE EMPLOYEES DEMAND

A high type of employee is essential to public utility work. A fair rate of compensation must be offered in order to attract and hold this type of employee but it will by no means buy loyalty or the co-operation necessary to the ideals of public service. Such employees demand the opportunity to develop as individuals; to advance in position; to broaden their knowledge; to work under safe, sanitary conditions; to feel secure from the tragedy of dependent old age.

Vocational misfits never become satisfied or efficient employees and we believe, therefore, that wherever practicable centralized employment by vocational experts is a decided step in the right direction. It is equally essential that the desirable employee be given every opportunity to advance in the organization. Promotion lines should be definite and the employee should be encouraged to prepare himself for advancement. A central clearing house of the personnel would seem the only effective solution

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Oxygen, Water Vapor Factors *in* Interior Corrosion

J. A. Harritt, H. M. Barnes, F. M. Cota, Otto Goldkamp, D. H. Perkins, and C. E. White, all of the San Diego Consolidated Gas and Electric Company, are submitting the paper abstracted below, as a progress report on an investigation conducted as a California Gas Research Council activity.

THE problem of internal combustion of mains and meters has been the subject of much experimental work by the San Diego Consolidated Gas & Electric Company. The activities of the committee have, in general, followed the lines of investigation suggested by the late Mr. M. V. Watson in his report presented by the California Gas Research Council in 1924. Mr. Watson's experiments led him to the belief that the fundamental cause of interior pipe corrosion was the action of oxygen in the presence of moisture, this effect being accelerated by the presence of hydrogen sulphide. His conclusions were that a reduction in the amount of oxygen in the gas would lessen corrosion, while drying the gas would eliminate corrosion.

J. A. Harritt

Since the above-mentioned paper was written, some further tests have been made, the results of which are given in a brief progress report.

FIELD OF EXPERIMENTATION

The question of the effect of the quantity of oxygen in the gas was of interest because of the practice in the San Diego plant of reviving purifiers by the constant addition of air to the gas entering the purifiers. Experiments have been made during the past year in an endeavor to test (1) the effect of reviving purifiers by the above method as compared with the batch method of revivification on the corrosive qualities of gas, and (2) the effect of dehumidification on the corrosive qualities of gas.

Effect of Increase in Oxygen Content Caused by Revivification in Situ. In order to test the effect on the corrosive qualities of gas when reviving purifiers by the constant addition of a small amount of air to the gas, experiments were conducted with two small purifiers. Gas to which air had been added passed through one purifier and over a set of test pieces; and gas without air passed through the other purifier and over a similar set of test pieces.

The surface of the pieces exposed to gas with air indicated more corrosion than that of the pieces exposed to gas without air when examined visually during the test. When the samples were removed after four and one-half months, those exposed to gas with air carried a heavier coating of rust than the others, but the action had not progressed far enough to show a difference on the metal surfaces after cleaning.

The condensate taken from around the samples exposed to gas with air contained more cyanides than that from the side without air, while the latter contained more sulphates. Thus it can be seen that definite conclusions cannot be drawn from this series of tests regarding the relative merits of the two methods of revivification.

The results of several years' observation of conditions found in the high-pressure districts appear to justify the conclusion that the interiors of mains and meters suffer practically no corrosion when exposed to dry gas—that is, when the dew point of the gas is below the lowest temperature reached in the system.

A series of laboratory tests in which gas was dried by impingement on sulphuric acid indicated that dry gas has no corrosive action on leather diaphragms or metal.

Experiments on a semi-commercial scale showed, with one exception, no internal corrosion from the effects of dry gas; while test pieces and meters exposed simultaneously to moist gas ahead of the dehumidifier were badly corroded. In the one case where the meter diaphragms darkened, it is not certain that the gas was dry at all times.

From the results so far obtained, the committee feels justified in concentrating its activities on the problem of dehumidification on a commercial scale. Several methods other than dehumidification by sulphuric acid are now being experimented upon.

Factors *in* Prolonging *the* Life *of* Buried Pipe

An abstract of a paper to be presented before the Technical Section by H. S. Christopher, Southern California Gas Company, covering an investigation sponsored by the California Gas Research Council.

LATE in 1923 an investigation of the problem of pipe corrosion, sponsored by the California Gas Research Council, was begun by the Southern California Gas Company, with the object in view of finding a means of pipe protection best adapted to use under the corrosive soil conditions existing in many parts of California. The program of investigation outlined for this work contemplated collection of varied corrosion data in the Gas Company's operating territory and elsewhere in the State through employment of a report of underground pipe inspection. Tests and experiments in keeping with the general plan for attacking the problem were devised to augment and extend as far as possible the available information concerning corrosion and protective pipe coatings. This work has been progressing steadily since the time of its inception, and a number of interesting observations have been recorded. The object of the present paper is to consider briefly several aspects of the pipe-protection problem such as the selection and application of protective coatings that have seemed to occupy positions of importance.

H. S. Christopher

1. The question of proper selection and application of protective coatings is a very important one in the general problem of extending life of steel or iron pipe in the ground.

2. Cleaning of the pipe prior to coating application is necessary to secure the best results from any protective material or process. Unless dirt, loose scale, and other adhering foreign matter are effectively removed from the pipe surface, the coating will not adhere properly. Among the more important methods for cleaning pipe may be noted acid pickling, electrolytic pickling, sand blasting, sand scouring, and scratch brushing. Pickling processes are not well adapted to pipe cleaning on account of their high cost, and the danger that corrosion-stimulating chemicals may be left in the pores of the metal. Sand blasting, though a very effective cleaning process, is costly to use, and suitable machinery for applying it to pipe has not yet been devised. Power scratch brushing offers a rapid and effective means for preparing new pipe surfaces for the reception of protective coatings. A machine imparting to pipe a continuous forward helical movement so that every part passes under the brush is best suited for use where the scratch-brush cleaning method is employed.

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Combustion Charts *for* California Gases

The scope of a paper written by F. A. Hough of the Southern Counties Gas Company, and presented through the California Gas Research Council, is indicated in the accompanying abstract.

TO facilitate the calculation of furnace test results when the gaseous fuels of California are used, the necessary combustion data for these fuels have been collected in tables and plotted in combustion charts. Use of these tables and charts eliminates entirely or reduces to the simplest arithmetic the calculation of the following items of interest in furnace-testing work.

F. A. Hough

1. The percentage of excess air corresponding to any percentage of CO_2 in the flue gases.

2. The percentage of excess air corresponding to any percentage of O_2 in the flue gases.

3. The heat lost up the stack per unit of fuel burned for any flue-gas temperature, any percentage of excess air, and any percentage of CO.

4. The total volume of combustion products passing through the furnace per unit of fuel burned.

5. The maximum ideal flame temperature of each of the fuels.

6. The ideal flame temperature of each of the fuels when burned with any percentage of excess air.

The charts also afford a means of checking the accuracy of flue-gas analyses, and supply the fundamental data necessary for calculating heat balances for fuels for which special charts have not been included.

Charts have been included for the following fuels: (a) natural gas; (b) Los Angeles City gas (natural and artificial); (c) oil gas; and (d) fuel oil.

The charts are based on a large number of actual analyses of these fuels, and are so constructed that any variations that normally occur in the composition of these fuels can be taken into consideration.

The tables and charts are accompanied by a detailed description of the methods used in preparing them and the methods used in applying them. Illustrative problems and a bibliography on furnace testing are also included.

Industrial Sales Report

F. M. Banks, chairman of the Industrial Sales Committee, presents the following summary of his committee's work. Other members of the committee are: H. W. Elder, L. C. Haffner, A. J. Hill, Lee B. Mettler, H. L. Warren.

THE work this year assigned to the Industrial Sales Committee was of a more general nature than the rather specific reports made by the Industrial Gas Utilization Bureau in 1925.

A paper by H. L. Warren, heating engineer of the Southern California Gas Company on "Gas Fired Equipment in Large Buildings" was read at the first sectional meeting in San Francisco. The subject as presented had as a background extensive experience in heating buildings with low pressure boilers designed to use gas under conditions as existing in Southern California. Operating costs were compared with those of other fuels and of other types of equipment.

F. M. Banks

"A Discussion of Natural Gas Engine Business in Southern California" was presented by the writer at the second sectional meeting in San Diego. The paper offered some specific operating costs and detailed comparisons with electric motor operation.

At the third sectional meeting, held in Portland, L. C. Haffner of the Portland Gas and Coke Company presented a paper on "Relations of the Industrial Load and Tariff Structure." This work involved a detailed study of the relative efficiencies of utilization of various fuels, and disclosed the relative magnitudes of the types of business involved. In conjunction with similar work done by the American Gas Association this work is of value in applying constructive industrial rates to Pacific Coast conditions.

In addition to the subjects mentioned a number of articles have been written for trade magazines dealing with factors of industrial gas usage on the Pacific Coast.

INFORMATION ON SURVEY APPENDED

As an appendix to this report is a brief account of an industrial survey made this year by the Southern California Gas Company. Information obtained in this way, if not already available to the utility, is of vital importance, It affords a most effective means of analyzing present conditions, without which it is extremely difficult to determine what steps should be taken to further the industrial utilization of gas in the most effective manner. It is the recommendation of this committee that such work be undertaken where possible under plans similar to those outlined by the American Gas Association last year.

For future work of an Industrial Committee it is suggested that the work outlined by the committee in 1924, the first three portions of which were covered in detail by the committee in 1925, should be systematically carried on, taking as many sections as feasible. Further, that this work should be compiled in such a manner as to be definitely applicable to each of the various sections of the Pacific Coast, and that such information be sufficiently detailed to show (1) value to customer; (2) value to utility; (3) basis for rate structure.

Mr. Banks has prepared this abstract of the report on an industrial survey made by the Southern California Gas Company, which report was appended to the Industrial Sales Committee's report.

The Survey Committee of the American Gas Association for 1925 has made definite suggestions for operating industrial surveys and has supplied data which prove their value. The purpose of such surveys is to show where, when and how to sell industrial gas.

Before making a survey the Southern California Gas Company studied the methods employed by a number of utilities, and from them worked out a plan suitable to its own immediate needs.

LISTING THE PROSPECTS

All prospects were listed in three groups: *Live Prospects,* whose application of heat corresponds with similar successful applications.

Research Prospects, whose heat requirements can be supplied with gas, but for research is necessary to overcome present competition.

Future Prospects, whose heat requirements would cost more with gas unless changes should be made in methods of operation or rates; which will not warrant main extension investment at present.

Further segregation was made into 28 major classes based on the character of the industry, each with sub-classifications for specialized branches of the industry.

A Research Committee classified and completed data brought in daily by the field men. Permanent record cards were made out for all whose gas consumption was estimated to be in excess of 500,000 cubic feet per month. These cards were then filed alphabetically by territorial divisions, each noting code number and letter.

This work required the services of five men for 30 days and one man for 25 days, and covered about 837 square miles of territory.

INDUSTRIAL SURVEYS PAY

It is felt that a survey so conducted can be made to pay for itself within a short time. Data is so recorded as to be susceptible to further detailed study by groups. As the first group is canvassed actual research work must be conducted on the most immediate prospects of the second group. Failing in this, much data concerning the Research and Future Groups will become obsolete in a short time. It must be admitted that this is a hazard of any survey which is not complete in every respect when the most active compilation of data is terminated.

On the other hand it can be fairly said that by this method of operation the foundation of a complete survey lies within the means of almost any utility. Further work will then depend upon results forecast by the data in hand.

Unquestionably, the future of gas in the industrial world depends upon research. The work being done by our association is of inestimable value, but that alone is not sufficient. Final results are measured by fuel bills paid, and those depend upon the knowledge each of us has of his particular market, and upon the extent to which we have applied data being furnished to us by our associations.

CUSTOMERS' SERVICE MANUAL ISSUED BY P. G. & E.

That customers may make the most of "Pacific Service," the Pacific Gas and Electric Company has recently issued a service manual to customers.

The Use *of* Various Types *of* Refractories

Through the California Gas Research Council H. J. Knollman of the Los Angeles Gas and Electric Corporation presents a paper on "The Use of Various Types of Refractories, and the Influence of Other Factors on Generator Operation," the scope of which is outlined for WESTERN GAS as follows.

At the last convention of the Pacific Coast Gas Association, Mr. Knollman presented a paper entitled "Some Refractories Problems in the Oil Industry," which created a great deal of interest in the refractories problem. The possibilities of certain changes in generator construction were pointed out, and the probable value of super-refractories and better methods of installation were discussed.

H. J. Knollman

During the past year extensive tests have been conducted by the Los Angeles Gas & Electric Corporation on checker brick and other factors that affect generator operation. The paper to be presented by Mr. Knollman at this year's convention is based upon the results from those tests.

SCOPE OF PAPER

The paper deals primarily with some checker brick tests, using Carbofrax, Diamel, and regular fire brick, which were conducted in regular straight shot gas generators at the Los Angeles Gas & Electric Corporation's plant. Brief mention is made of the essential equipment used, and the reasons for its selection.

Data and discussions are given of the principal results obtained, which embody such items as generator capacity, efficiency of manufacture, heat distribution, limiting factors, and the influence of various definite loads on these factors. The relation between some of these factors and the different types of checker brick used are considered. The effect on generator capacity of a considerable reduction in the number of checker brick used in the generator is also discussed.

Some data on the principal by-products formed—naphthalene and tar—are given, and some further lines of research that appear profitable are pointed out.

GLOBE, ARIZ., UTILITY BOUGHT BY W. B. FOSHAY CO.

The W. B. Foshay Company of Minneapolis has purchased the Globe Light and Power Company of Globe, Ariz., and the utility is now known as the "Peoples Arizona Gas and Electric Corporation." There will be no change in the personnel, local management or the officials.

LOS ANGELES CHAMBER TO HOLD TRADE EXPOSITION

Some 16,000 buyers are expected to attend the industrial and trade exposition being conducted by the Los Angeles Chamber of Commerce on the dates August 16-22. Oil and gas men will find a special exhibit prepared for them, ranking as one of the most important in the exposition.

Committee *on* Credits *and* Collections Reports

Summarized below is the report of the Credits and Collections Committee, membership of which consists of M. W. Thernes, Spokane Gas & Fuel Co., chairman; F. L. Nagel, Portland Gas & Coke Co.; A. R. Foster, San Diego Consolidated Gas & Electric Co.; Fred Fischer, Midway Gas Co.; F. P. Raymer, Southern Counties Gas Co.; G. E. Ketter, Los Angeles Gas & Electric Corp.; G. B. Furniss, Pacific Gas & Electric Co.; J. A. Butler, Southern California Gas Co.; Horace Cline, Los Angeles Gas & Electric Corpn.; H. P. Humphreys, Pacific Gas & Electric Co.; O. L. Moore, Los Angeles Gas & Electric Corpn.

THE Credits & Collections Committee had two subjects to report on this year. The first one was to justify the existence of a credit and collection department.

Your committee, by citing collection conditions after a fire, has attempted to show that a credit and collection department is necessary to the existence of any business, whether large or small. There seems to be no better way of justifying the existence of a credit and collection department than to show that business could not exist without it. We believe we have shown this.

M. W. Thernes

The second subject was to make progress towards the elimination of the customer's deposit, relying instead upon credit information obtained from other utilities. For the present this was not considered practical for industrial and commercial accounts, nor for third and fourth class residence and apartment houses districts.

REPLIES FAVOR PORTLAND PLAN

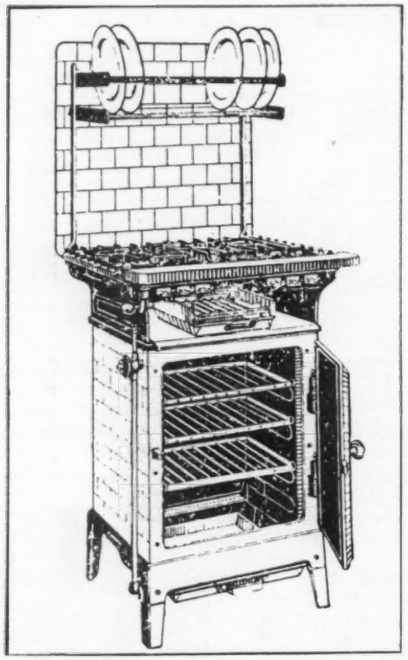
In response to questionnaires mailed to all companies in the Pacific Coast Gas Association, your committee received 34 replies. Of this total, 27 companies were in favor of trying the Portland plan which has been looked upon with favor by the Pacific Coast Gas Association, and six were not in favor of it, and one was neutral.

If the Accounting Section is really desirous of determining the value of this plan, we suggest that the committee, next year, keep in touch with these 27 companies.

The committee was asked to make progress toward putting this plan into operation and we believe we have made the start which, if followed through, will prove by actual practice whether or not this plan is practical.

H. J. FORWARD LEAVES WYOMING FOR ALBUQUERQUE, N. M.

H. J. Forward, formerly manager of the Sheridan Gas and Fuel Company of Sheridan, Wyo., has assumed the duties of gas superintendent for the Albuquerque Gas and Electric Company, Albuquerque, New Mexico. His work at Sheridan was taken over by Judson Bibb, until recently manager of a utility company at Libby, Montana. The gas plant at Sheridan has been watched with interest during the past year or two, due to the fact that local lignite coal is being successfully used for gas generation.



This picture was taken from a recent advertisement of an English gas range. Note the oven heat control.

Gas *for* Cooking Claims *a* Romantic Background

¶ Here is proof of the contention that the gas industry has not capitalized its "past" sufficiently. The romance of coal, the romance of oil, and the more recently exploited romance of electricity have become by-words, while the gas industry sat supinely by. Mr. Smith, writing this paper for presentation before the Gas Appliance Society's school, has unearthed several colorful shreds of background which make entertaining reading and might afford ideas for some strong ad-copy. The lecture of which this paper was a part was headed, "The Selling and Selection of a Gas Range."

By GEO. W. SMITH
Southern Counties Gas Co.

MAN is the only animal that is able to make use of fire. It took him a long time to learn how to make it at will, how to control it, and how to use it effectively. He used it first to protect himself from wild beasts and to keep himself warm; later for lighting and cooking purposes.

The walls of the tombs of the Egyptians portray as early as 4000 B. C., the preparation of meals. A painting of the royal bakery and kitchen of Rameses III about 1600 B. C. illustrates boiling in pots and frying on griddles. Bas-reliefs of camp life of the Assyrians and the Babylonians, give pictures of cooking over small braziers and baking in a cylindrical stove. Man of the Glacial period roasted his meats on sticks over embers of an open fire. In Homer's time, meat was roasted in barbecue fashion.

COOKING COMES TO CHINA

In a dissertation on roast pig, Charles Lamb relates entertainingly how a Chinaman, who had kept his pig in the parlor, discovered how to cook meat. His house caught on fire accidently and burned up. While poking among the ruins his hand came in contact with the dead pig which was still very hot. His fingers were severely burned and he quickly thrust them into his mouth. Some of the burned flesh of the pig had stuck to his fingers and so he found his fingers very palatable. This was his first taste of cooked meat and so good did roast pig seem that the Chinaman continued to rebuild his house and to burn it down in order to get roast pig, until finally he discovered he could get roast pig without going to the trouble to build and burn his house.

The early application of gas for cooking makes a highly interesting story, but only a few of the main facts may be mentioned here.

WINSOR LEADS THE WAY

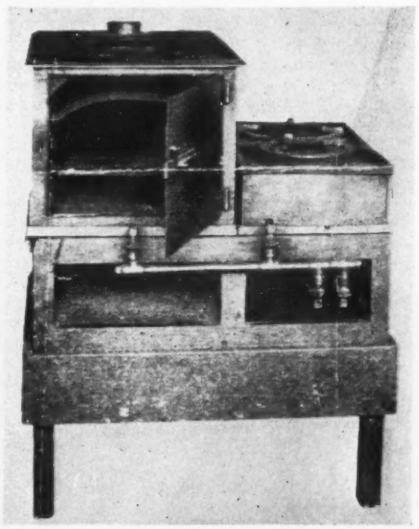
Winsor was probably the first to suggest manufactured gas for cooking and heating in his patent of 1805. Little of either was done until 1825, when a magazine described a small oven having a circle of gas flames with a reflecting cone enclosed in a cylinder of tin, from the top of which a pipe carried off the burnt air.

"Nay, it is probable that the same flame that furnishes light will serve to warm my room and even dress my victuals in case of need and by the mere turning of a cock, or corking or uncorking of a small pipe or two." Thus did Winsor prophecy the universal application of gas for lighting, heating and cooking.

James Sharp of North Hampton, England, demonstrated in 1830 in his own home the possibility of gas cooking. A few years later John Barlow had a kitchen apparatus for roasting, boiling and steaming. Inventions for cooking and heating by gas became numerous. In 1850 James Sharp roasted a quantity of meat and cooked a variety of vegetables, in connection with a lecture on gas. A French chef roasted a joint of meat weighing 535 pounds in a brick oven equipped with 216 gas jets. Alexander Graham exhibited a gas cooking oven in 1851.

In 1851 Samuel Clegg, Jr., in a letter to the Editor of the Journal of Gas Lighting, wrote: "In the Expositor of last week, I found a portrait of Mr. Sharp, the Manager of the South Hampton Gas Works, and an article claiming for him the invention of cooking by gas. Now I do not believe any man living can claim it as his invention. In 1779 Dr. Clayton boiled eggs by a gas flame. In 1793 Mr. Murdock frequently cooked chops and baked over gas jets and in 1844 I perfectly well remember the men at the Aetna Iron Works near Liverpool making a gas cooking apparatus which consisted of a gun barrel turned backward and forward and pierced with numerous holes. When anything had to be fried, the gridiron was kept in a horizontal position, and for anything that had to be roasted, it was turned in a vertical position, and a plate of tin was placed behind the meat as a reflector. Mr. Sharp may have contrived a stove for cook-

(Continued on Page 76)



This gas range needs no apology for its somewhat disreputable appearance. It is the first gas range built in the United States, sometime back in the "Roaring Forties."

Clock Premium Sale Turns Ranges *in* Portland

By JOHN H. HARTOG

Sales Manager, Portland Gas and Coke Company

IN CASTING about for an inducement for women to buy gas ranges in the dull month of June, when everybody's mind was on vacations and outings, the Portland Gas & Coke Company decided to offer a $7.50 (retail price) Hawkeye Reminder Clock as a premium.

As this Clock was not known ,it was necessary to first create a desire to have the clock, before this desire could be capitalized.

The Company could not afford to give these clocks with every range, including cookers and re-built ranges, so it was decided to offer them only with new Smoothtops.

When it came to ordering a quantity it was decided, with some misgivings, to attempt to sell 200 new Smoothtops besides the other ranges. It took a lot of faith to so plan, because National Gas Range Week was not so far in the past, at which time the potential demand was pretty well filled up.

Finally it was decided to take a chance on 200 clocks.

At first the sale did not gain much headway but by continuous stimulation and effort the goal was surpassed and by the time the sale ended on July 1st everybody was surprised that the total aggregated 456 new Smoothtops. Not all of these received "Hawkeye Reminders" as approximately half of this quantity was sold to 13 apartment buildings, the larger being the Rex Arms with 59 kitchens, taking 59 Smoothtops.

This beats all records made by the Portland Gas & Coke Company for the sale of Smoothtop Gasranges since they first came into the market.

Besides the cost of the premiums, in round figures nearly $1000.00, about $1100.00 was spent on display advertising. It took considerable faith to plan to spend between $2000.00 and $2500.00 on clocks and publicity but the results justified the expenditure.

City *of* Long Beach Plans *to* Erect Gas Plant

TO guard against a failure of its supply of natural gas from present sources, the gas department of Long Beach, Calif., is looking to the erection of a gas plant in the near future, according to Assistant City Manager G. L. Buck and Superintendent of the City Gas Department W. A. White. Already the gas sources of the fields at Athens, Dominguez and Rosecrans are supplementing the principal supply drawn from Signal Hill and Los Cerritos, with other extensions of the gathering system—possibly to Huntington Beach fields—contemplated.

Contracts have been let for driving the piling of foundation supports for the gas plant, and after general specifications of the plant have been presented to the city council bids will be asked on the entire plant.

Unit construction will be followed, the first unit to have a capacity of 5,000,000 cu. ft. a day, other units of similar capacity being added as the supply of natural gas declines. The first unit is desired complete by December 1, but will not operate while the supply of natural gas is abundant. Blended gas will be manufactured along the general lines of Los Angeles practice.

H. L. Masser

W. E. Houghton

L. A. G. & E. Offices Filled in July Directors Meeting

AT the regular monthly meeting of the board of directors of Los Angeles Gas and Electric Corporation held July 28th, the vacancies in the offices of third vice-president, treasurer and director caused by the recent death of C. A. Luckenbach were filled.

W. E. Houghton, for a number of years comptroller of the corporation, was elected vice-president and treasurer. He has been in the service of the Los Angeles Gas and Electric Corporation, with the exception of one or two short periods, since November, 1897, when he was first employed as a clerk. In 1906 he became auditor, remaining in that position until he was made comptroller, in 1917. He has also been a director of the company since 1920. Mr. Houghton is well qualified by experience and training in utility financing and accounting, of which work his new position will place him in control.

H. L. Masser, gas engineer of the Corporation, was chosen to fill the vacant position on the directorate. He will still continue to serve as gas engineer.

Mr. Masser is recognized as one of the leading public utility engineers of the country. Before coming to the Los Angeles Gas and Electric Corporation, in April, 1924, as gas engineer, he was for five years in a similar position with the California State Railroad Commission. During the greater part of his career with the Commission he was located in Los Angeles, where he had supervision of gas operations in Southern California. At the time of the gas shortage several years ago he represented the Commission as Gas Administrator, in which capacity he was charged with the equitable apportionment of the available supply of natural gas among the various distributing companies. As gas engineer with the Los Angeles Gas and Electric Corporation Mr. Masser has direct engineering supervision over all gas operations, both of production and of distribution. His appointment as director of the Corporation is a merited recognition of his valuable services to the organization.

HELIUM STRUCTURE IS BOUGHT BY GOVERNMENT

Seven thousand acres on the Woodside structure in eastern Utah, about midway between Green River and Price, will be turned over to the Federal government as a result of transactions concluded by the government with the Utah Oil Refining Co. and affiliated companies. A well brought in about two years ago on that structure is rich in helium gas, though of no other commercial value. The Utah Oil Refining Company will plug the well off under direction of Bureau of Mines experts. The sum of $130,000 was paid the Utah Oil Refining Company.

Semi-Annual Convention *of* Gas Appliance Society

WEDNESDAY, August 11, has been designated as the date of the seventh semi-annual convention of the Gas Appliance Society of California. The membership of that organization will also have an opportunity to sit in on some of the sessions of the Retail Furniture Dealers' Association and to inspect the exhibits arranged for Furniture Market Week, both of which events are being held in San Francisco from August 9 to 14.

A joint dinner meeting is to take place the evening of August 11, when members of the Gas Appliance Society and the Retail Furniture Dealers' Association will both listen to a program of music, entertainment and addresses. Frank H. Beckman of the Beckman Hollister Company will speak on "Salesmanship," and Richard M. Neustadt, manager of the San Francisco Retail Dealers' Association, will speak on "Merchandising," as affecting the gas appliance department.

There is to be a Gas Stove Departmental on the evening of August 9, given over to an exposition of the best practices in installation and servicing of gas ranges.

A State-wide Fall campaign for gas heating appliances is being planned by the Society, the campaign to open with a week of demonstration and exhibit, followed by three months of special sales effort. Information relating to the campaign will be released at the convention.

RADIO TALK ON FIRST AID BROADCASTED IN SAN DIEGO

W. E. Richmond, first aid and plant employment officer of the San Diego Consolidated Gas and Electric Company, recently delivered a talk on general first aid practices over Station K F S D, San Diego, Calif.

FOREIGN GAS EXHIBITION IN ANTWERP, BELGIUM

Under the patronage of His Majesty King Albert I there was recently opened in Antwerp, Belgium, an international gas exhibition, with elaborate exhibits from Belgium, Holland, England, France, and other countries.

NATURAL GAS PLUS SILICA EQUALS GAS INDUSTRY

Continuous natural gas supplies may prove to be the genesis of a glass industry of large proportions in two counties of Colorado—Larimer and Moffat counties, where silicia is known to exist in abundant quantities.

A. B. MACBETH NOMINATED FOR A. G. A. PRESIDENCY

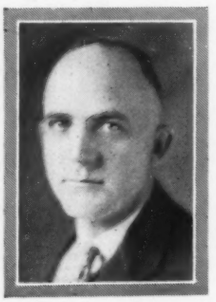
A. B. Macbeth, executive vice-president for the Southern California Gas Company and Midway Gas Company, has been nominated for the presidency of the American Gas Association, the elections to be held during the October convention at Atlantic City.

CARBON BLACK PRODUCTION SHOWS DECREASE

According to reports to the Bureau of Mines from 63 plants operating in eight states, carbon black production in 1925 amounted to 177,417,378 lbs., or 5 per cent under year previous, being the first decrease since 1920. Deliveries to consumers were higher than ever before, the total for the year being 175,631,326 lbs., an increase over 1924 of 36 per cent, due to a radical change in the stock situation. Stocks were largely increased in 1924, remaining steady in 1925.

J. A. Martin

A. J. Hartfield



Geo. Finney

Manufacturers Launch New Gas Furnace Association

AT an organization meeting held in Los Angeles the evening of July 7, 20 gas furnace manufacturers of Southern California launched a new trade group to be known as the Gas Furnace Association. Virtually all of the furnace lines manufactured in Southern California are already represented in the new association, including firms in Los Angeles, Pasadena, Glendale, San Diego, and other points.

J. A. Martin, president of the Phillips Heating, Ventilating and Manufacturing Company, heads the Gas Furnace Association, being elected to the presidency at the July 7 meeting. A. J. Hartfield, president of the Pacific Gas Radiator Company, will serve as vice-president. The secretary-treasurership will be in the hands of Geo. Finney whose services in connection with the launching of the Gas Appliance Association of Southern California commended him to the furnace group. The directorate will consist of the above officers and the following men: Bert Scott, A. J. Braasch, A. V. Payne, F. H. Ohrmund, Kenneth Belden.

Three distinct motives lie behind the organization just effected. A standard installation code is to be established for the association's members, guaranteeing to every furnace purchaser that his installation will heat the home in which it has been placed from 30 degrees Fahrenheit to 70 degrees. This is decidedly a new development in the furnace industry, and is made in the faith that the best interests of the industry lie in protecting the interests of purchasers. A standard contract form protecting both purchaser and manufacturer is to be in use. The standard code is to be widely distributed among architects, contractors and builders in California.

As a second important activity of the new association a credit bureau will be conducted, disseminating information on all accounts to all members.

Collective advertising is the third purpose to be furthered. Institutional copy designed to sell warm air gas heating will be carried in both consumer and trade mediums.

Plans are already under way for the conducting of a school for gas furnace salesmen, which is to be given under the auspices of the Gas Furnace Association through the University of California, Extension Division. Only salesmen employed by members of the Association will be eligible to take the course, by ruling of the University of California. The course will cover gas and gas analysis, and will be launched September 1. Geo. Finney, secretary-treasurer of the organization, states that over 100 applications for enrollment in the school have already been made. A $10 fee is to be charged for the course.

Headquarters of the Gas Furnace Association will be maintained at Room 635, Chamber of Commerce Building, Los Angeles, Calif.

GEOLOGICAL SURVEY WORK PROGRESSING IN CANADA

Five geological parties and three topographical survey groups are in the field for the Geological Survey of Canada in connection with oil and gas lands in Alberta.

ELECTRO-GAS FURNACES USED WHERE ELECTRICITY FAILS

Our old geography text tells us that it is winter this month in Australia. Remembering this seasonal difference, it is easy to understand why the Palais Royal—dance hall magnificent of the town of Sydney—has recently installed 26 Electro-Gas Furnaces to replace 250 electric heaters. Electric heaters had previously been relied upon to supply warmth, but although the 500 units of the electric system consumed current to the cost of 22 pounds Sterling every evening, the patrons nevertheless complained of the mid-winter chill. Hence the installation of gas burning equipment. The management of the Palais Royal is well pleased with the purchase, being enabled to save many pounds per day on operation and, what is more important, they keep the hall heated.

L. A. SERVICE GROUP SEES MOVIES "EN MASSE"

Many and varied are the activities of the Los Angeles Gas and Electric Corporation's employee organization, known as L. A. Service Group. The latest was attending on July 19 a showing of "The Black Pirate" (Douglas Fairbanks) and "Sparrows" (Mary Pickford) at Grauman's Egyptian Theatre, Hollywood, Calif.

PHILIP B. TAYLOR MANAGING SALES FOR WATER HEATER COMPANY

Philip B. Taylor, formerly Southern California representative for the C. B. Babcock Company, has been appointed sales manager for the Thompson Water Heater Company of Glendale, Calif. This company, recently organized with G. O. Thompson as president, has been manufacturing gas-fired water heaters for the past year and distributing them through the plumbing trade. T. H. Menk is secretary and treasurer for the organization. After completion of remodeling the factory at Glendale the company plans to put more extensive merchandising efforts back of its heaters.

Long Beach Ford Factory May *be* Big Gas User

WITH the erection of the newly-projected Ford Motor Company factory in Long Beach, Calif., the gas department of that city will in all probability take on an industrial load of first importance. Announcement of the definite signing of contracts for the location of the manufacturing and assembling plant of the automobile company came in telegraphic form on July 13 and work at the Ford site is expected to be begun at once by the Union Pacific Company, which is one of the parties in the transaction.

By the terms of the contract between the Ford Motor Company and the city of Long Beach a plant will be erected having floor space not less than 350,000 square feet, and the blue-prints of the company's plans call for building space of 440,000 square feet. It is estimated that some 1,200 men will be employed in the factory.

Fuel needs for a plant of this size would considerably increase the send-out of the city gas department. In the Southern California Edison Company's plant on Terminal Island the city already claims the largest single gas consumer in the world, according to W. A. White, superintendent of the department. The Edison Company's daily consumption was running between 33,000,000 and 34,000,000 cu. ft. during the latter part of July.

Gas for the domestic and industrial needs of Long Beach is drawn from neighboring oil and gas fields. Negotiations are under way for securing additional supplies of dry gas from the Lomita fields, and wells now drilling to the 2700-foot zone in the Los Cerritos field should develop good gas yields, in the opinion of city gas department officials.

In the event that the Ford factory project will involve the manufacture of its own steel, said Mr. White, there would then be the possibility of blending coke oven gas with straight natural gas from the city's lines

"GAS LINES" IS NEW PAMPHLET ISSUED BY SO. CAL. GAS CO.

A small four-page pamphlet called "Gas Lines" is now being issued to Southern California Gas Company consumers, 175,000 copies of the first issue being distributed. Kate Brew Vaughn, well-known home economist writes a message on gas appliances in each number. The pamphlets are printed in the plant recently installed by the Southern California Gas Company.

ALAN E. MORPHY NO LONGER WITH PACIFIC GASOLINE

After a 10-year financial interest in the company, and four years of active service in its ranks, first as secretary and treasurer and later as vice-president and treasurer, Alan E. Morphy has requested to be released from his connection with the Pacific Gasoline Company. He will remain an officer of the Solano Company, which is an affiliated organization.

D. L. SCOTT TAKES AD CLUB CUP FOR "SACRED COWS" TALK

D. L. Scott, Manager Public Relations, Los Angeles Gas and Electric Corporation, brought glory to himself and his company by winning the trophy for the best talk before the Public Utility Departmental at the San Francisco convention of the Pacific Coast Advertising Clubs Association. His subject was "Some Sacred Cows of Advertising."

Plans Mature *for* Work *of* Natural Gasoline Ass'n.

APPOINTMENTS of chairmen for principal standing committees were made at the July 27 meeting of The California Natural Gasoline Association's executive committee, held in Los Angeles. The date for the next general meeting of the membership was set for August 18, the business session to follow an evening dinner at Paulais, Los Angeles.

Following are the committee chairmen appointments: Committee on standards and tests, R. W. Garman, Union Oil Company, chairman; committee on safety and fire prevention, H. L. Eggleston, Pan-American Petroleum Corporation, chairman; committee on metering, R. E. Beckley, Pacific Gasoline Company, chairman; program committee, J. A. Campbell, Lomita Gasoline Company, chairman; committee on proceedings, J. S. Watson, Shell Company of California, chairman; the membership committee has not as yet been appointed, its functions being exercised by the executive committee at present.

Monthly meetings of the general membership will be held from now on, about the middle of each month. The executive committee meetings are held on the second and fourth Wednesdays of each month. Stenographic record of proceedings at general meetings of the Association are to be kept henceforth, and will be published from time to time, being distributed among the paid membership.

Beginning with the September issue, *Western Gas* will devote a special section of its editorial contents to the California Natural Gasoline Association, and members of that organization may consult this department for announcements from the executive committee, as well as reports on past meetings of the Association.

RAWLINS DISTRICT TO HAVE GASOLINE PLANT

A gasoline plant is under erection for the Prairie Oil and Gas Company near Rawlins, Wyoming.

GASOLINE UNIT UNDER WAY IN SOUTHEAST COLORADO

Following tests of gas from wells on the El Frisco Ranch in Southeastern Colorado, which revealed a gasoline content of 2.2 per thousand cubic feet, the Mountain States Oil Corporation has decided to erect a unit of a gasoline absorption plant to treat the gas. Materials were fabricated by the Campbell Engineering Company of Long Beach, Calif.

GAS CHEMICALS CORP. BUILDS PLANT IN AMARILLO FIELD

The Gas Chemicals Corporation, recently incorporated in Colorado, is building a casinghead gasoline plant in the Amarillo field of Texas. The plant will soon be treating 25,000,000 cubic feet of gas daily, the additins to be made bringing the total up to 100,000,000 cubic feet.

NEW GASOLINE PLANT FOR TEAPOT DOME GAS

Near Evansville, a few miles east of Casper, Wyo., a gasoline extraction plant is to be erected by the New York Oil Company to take care of the increased production from the Teapot Dome field. The plant will be located at the terminus of the pipeline from the Teapot Dome fields, and will treat gas which has already gone through the New York Oil Company's plant at the fields. A contract on casinghead gas from Teapot Dome is held by the New York Oil, the dry gas being distributed in Casper.

P. V. D. Manning

Lester O. Warner

Paul D. Barton

New Natural Gasoline Firm Enters Consulting Field

NEWLY organized to operate in the natural gas, natural gasoline and petroleum field, the firm of Barton, Manning and Warner announces the establishment of laboratories at Alhambra, near Los Angeles, Calif. All of the members are specialists in the technical end of the natural gasoline industry, and will conduct commercial research, process development, appraisals, etc., as well as engaging in chemical engineering.

Paul D. Barton, now president of the California Natural Gasoline Association and formerly manager of the United Oil Company's gas department, is a graduate of the University of Oklahoma and the California Institute of Technology. He is a member of Phi Beta Kappa, honorary scholastic fraternity, and Alpha Chi Sigma, national chemical fraternity, being president of the Los Angeles professional group of the latter organization. Mr. Barton for three years was engaged in research on lubricating oils for the General Petroleum Corporation of California.

P. D. V. Manning joins the firm after extensive experience in the east, having specialized in activated charcoal work and oil shale research as a consulting engineer in New York City. He secured his A. B. degree at Stanford University, an M. S. degree at the California Institute of Technology, completing the work for his Ph. D. at Columbia, at which University he also served as faculty member in the department of chemical engineering. Mr. Manning is national vice-president of the Alpha Chi Sigma chemical fraternity.

Lester O. Warner for the past three years has been conducting research work for the Signal Hill Gasoline Company, and is the inventor of gas testing apparatus which is said to introduce a number of improvements over the Bureau of Mines system. Mr. Warner has made a number of valuable contributions in the research program of the California Natural Gasoline Association while engaged in research work on testing practice. He received a Bachelor of Science degree from the California Institute of Technology.

GAS IN MONTESANO DISTRICT

Gas in commercial quantities has been found in the Montesano district, Washington by the Garber interests drilling on an anticline west of Montesano.

CARBON PLANT IS BUILDING NEAR PANHANDLE, TEX.

Western Carbon Company is erecting a carbon black plant near Panhandle, Texas, which will utilize residue gas from the gasoline plants of Phillips Petroleum Company. The plant will be a six-unit affair.

NEW MONTANA STRUCTURE YIELDS LARGE GAS WELL

Drilling on a new structure in southern Montana, known as the Mackay Dome, the Ohio Oil Company has brought in a 50,000,000 cu. ft. gasser. If oil showings are not good, it is thought that the gasser will be used to supply Columbus and other towns of that section with natural gas.

FOURTH PLANT AT VENTURA FOR PACIFIC GASOLINE

Pacific Gasoline Company's fourth plant in the Ventura field is expected to be complete by August 1. It is located about a mile northeast of the No. 2 plant of the company, on the McGonigle Lease of the Associated Oil Company. Made up of two complete absorption units, the plant will have a capacity of 15,000,000 cu. ft. of gas daily. It will be tied into the intake system of the other plants by 1000 feet of 16-inch line.

STANDARD STRIKES GASSER IN HUNTINGTON BEACH FIELD

Estimated flow of 5,000,000 cu. ft. was credited to a gasser struck late in June in the Huntington Beach field on the Thompson farm by the Standard Oil Company.

DISCOVERY DEPLETION SUBJECT OF NEW RULING

A judgment of the Income Tax Department to the effect that a gas lessee was not entitled to discovery depletion on wells drilled by the oil lessee has been reversed by a recent ruling of the Solicitor of Internal Revenue. By the later ruling it is held that a gas lessee of property on which there exists a contemporaneous oil lease is entitled to discovery depletion as to all gas wells discovered on the leasehold tract by the oil lessee.

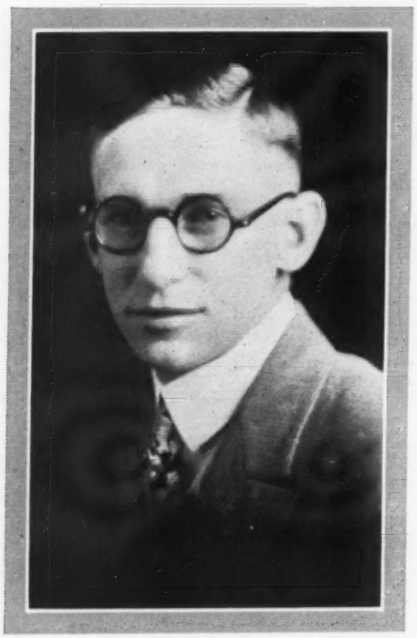
ESTIMATE OF GROSS YIELD OF NATURAL GASOLINE

Enough gasoline is being reclaimed from natural gas, formerly wasted, to keep more than 2,000,000 motor cars running, according to the American Research Foundation. It points out that the natural-gas gasoline output is now more than 3,650,000 gallons every 24 hours.

"More startling that that," adds the bulletin, "at the present time this natural-gas gasoline provides approximately 10% of the total motor fuel output of the United States.

"The manufacture of natural-gas gasoline is a young industry. It really got its impetus during the World War when for a time there was fear of a gasoline shortage.

Greetings to P.C.G.A.



GUY R. KENDALL
So. Cal. Repr.

You are cordially invited to visit our display room where practically all products manufactured by the Standard Gas Equipment Corporation may be seen.

Vulcan Smoothtop Gas Ranges
Oriole Gas Ranges
Triplex Gas Ranges
Vulcan Hotel and Restaurant Gas Ranges
Industrial Burners
Griddles
Hot Plates
Bake Ovens
Confectionery Furnaces
Bakers Stoves

The new Speed Burner will be interesting to all gas men, particularly to appliance men.

Northwest Gas & Elec. Equipment Co.

Pacific Coast Distributors

158 South Central Avenue
Los Angeles, California

NO MORE ARTIFICIAL GAS FOR CHEYENNE RESIDENTS

July 13 saw the last of artificial gas for consumers of Cheyenne, Wyo. Describing the introduction of the natural gas, the Cheyenne Tribune of July 11 says:

"With a score of more of possible future oil and gas structures mapped out by geologists within a 100-mile radius of Cheyenne, it is considered likely that the possibility is exceedingly remote for those living in Cheyenne today ever to see the time when it will be necessary to return to manufactured gas.

"Conservative estimates place the present gas supply at the Wellington field as sufficient to provide for all the needs of Cheyenne, Fort Collins and Wellington for a minimum of 20 years, allowing for a great increase in the amount of natural gas used, over that required at present.

"More than $600,000 was invested by the various interested organizations to bring the gas to Cheyenne. The two wells which are the immediate source of supply cost $150,000 each to drill, and the pipe line itself was an expense of approximately $300,000."

AD CUP WON BY L. A. G & E. FOR BEST UTILITY DISPLAY

For the second year in succession, Los Angeles Gas and Electric Corporation won the silver cup for the best display of public utility advertising at the annual convention of the Pacific Coast Advertising Clubs Association. The convention this year was at San Francisco, July 5 to 8.

Charles A. Luckenbach

COMING as a great shock was the death, on July 9th, of Mr. Charles A. Luckenbach, third vice-president and treasurer of Los Angeles Gas and Electric Corporation, after an illness of about a month. He had been with the Los Angeles utility for 29 years.

Chas. A. Luckenbach

Mr. Luckenbach was born in Bethlehem, Pennsylvania, in 1865. After graduating from Lehigh University in 1886, he was for three years chemist for the Crane Iron Company of Catasaqua, Pennsylvania. In 1889 he came to Los Angeles and for a year served as clerk of police courts, then three years as deputy city clerk, followed by two terms as city clerk of Los Angeles.

In August, 1897, Mr. Luckenbach entered the employ of the Los Angeles Gas and Electric Corporation as purchasing agent. In 1905 he became manager of construction, in 1917 third vice-president, and in 1924 he was made treasurer, also. He has been a director of the Corporation, also, since 1917.

A man of wide acquaintance and diversified activities, Mr. Luckenback was a member of organizations among which were the American Gas Association, Pacific Coast Gas Association, National Electric Light Association, Pacific Coast Electrical Association, the Elks, the Maccabees, Los Angeles Chamber of Commerce, Los Angeles Athletic Club, and Theta Delta Chi Fraternity.

He is survived by his widow, two sons, a granddaughter, a sister and a brother.

New Officers *and* Directors *for* Gas Appliance Ass'n.

A NEW slate of officers and directors of the Gas Appliance Association of Southern California was named at that organization's first annual meeting, held July 12. J. Graham Hambley of the company of that name is now the Association's president; F. M. Banks, Southern California Gas Company, is vice-president; Francis Regan treasurer, and H. L. Boyd, secretary.

J. Graham Hambley

On the Association's directorate are D. P. O'Keefe, Geo. A. Osgood, Jack C. Hayden, J. A. Martin, L. F. Stuffler, E. F. Hammel, J. M. Williams, L. G. Heyer, Fred Forrest, C. N. Boley, E. S. Hoyt, Jr.

It is the plan of the Association to eventually have an Advisory Board consisting of three past presidents. E. A. Norton of Barker Brothers, first president of the Association, is the charter member of this board, and two others, Guy Kendall of the Northwest Equipment Company, and Ross Monroe of the James Graham Manufacturing Company, were chosen to fill out the number of the board, awaiting the time when the organization shall have had the required number of past presidents.

THOMAS H. HALL REPRESENTS BABCOCK CO. IN SO. CAL.

The C. B. Babcock Company announces the appointment of Thomas H. Hall as its resident sales manager in Southern California. Mr. Hall has been with the Babcock Compnay since 1914 as sales representative in Northern California and the Northwest. Previous to his connection with the Babcock Company he had sales experience with the Southern Counties Gas Company and also with the Pacific Gas and Electric Company.

FORMER CARBON BLACK PLANT USES GAS FOR CANNING

The Teton Gas Products Company at Cowley, Wyo., formerly manufacturing carbon black, has been operated for some years as a starch works, and now is to be turned into a canning factory. Its production of carbon black ceased because of the claim that it was operating against the laws of the state, being within 10 miles of a municipality.

FREMONT NATURAL GAS CO. SOLD TO NEW YORK OIL

The Fremont Natural Gas Company, formerly owned by the Producers and Refiners Corporation, was sold by that organization late in June to the New York Oil Company. The utility has franchises to serve Rock Springs, Riverton, Lander, Hudson and Mills, all in Wyoming. W. S. Stronach will continue as manager of the company.

NEW FRANCHISE BALLOT IN DENVER POSSIBILITY

It is understood that citizens of Denver will vote on a new franchise proposition for the Public Service Company of Colorado, some time this fall.

We Offer You
The 'Edge' on Every Competitor

Can You Say This?

"Yes—I can furnish and install EVERY TYPE of gas heating appliance—for every kind of building."

How many heating installations are you losing? Losing because you haven't got the exact type of appliance needed.

How would you like to call on **every** job, confident in the knowledge that you can handle **every** kind of heating installation with your line?

—and to know that you are selling appliances of the **very highest quality!**

That's the way appliance dealers feel when they handle the Pacific Gas Appliance line. They're making money because they can go after every job, as they are not limited to selling one single appliance—but are specialists in all types of gas heating.

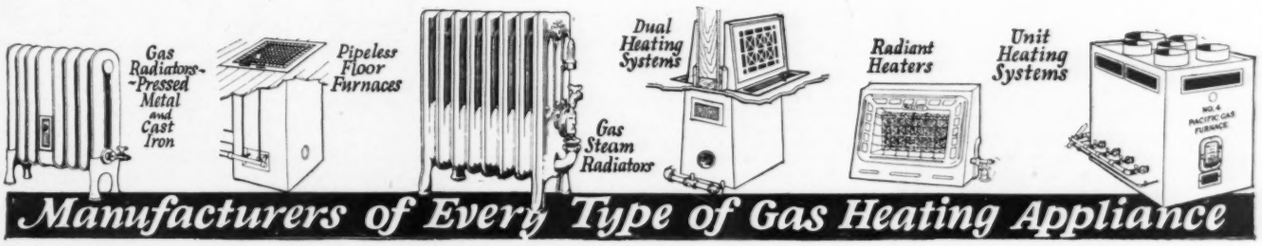
We've got a big money proposition for the right man in every town. Write for it —and see for yourself why Pacific is getting the cream of the business in every territory.

Pacific Gas Radiator Company

Gas Heating **Headquarters**

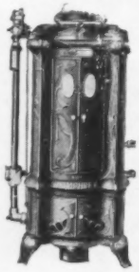
Phone BEacon 2190

1732 West Washington St. Los Angeles, Calif.



Manufacturers of Every Type of Gas Heating Appliance

P.C.G.A. Delegates



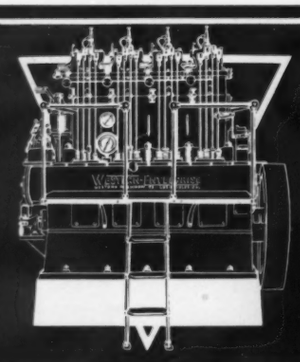
The Bungalow Annex of your convention hotel is equipped with Humphrey Water Heaters.

For forty years **Humphrey** has been building water heaters inexpensive to buy, inexpensive to use.

A new and important feature on the Humphrey heaters is the THERMOSTATIC SAFETY GAS SHUT-OFF. If the pilot light goes out for any reason, this shuts off the main gas supply.

HUMPHREY WATER HEATERS

Carl A. Boyce
Southern California Agent
935 South Grand Ave.
Los Angeles



WESTERN-ENTERPRISE
DIESEL ENGINES

Power that is dependable under all conditions, at all times; immediately available in any crisis; always ready for instant service; no "minimum" costs when idle, but decidedly minimum when operating. Write for the "Western" catalog.

WESTERN MACHINERY COMPANY
Offices & Factory — 910 North Main St.
LOS ANGELES, CALIFORNIA
San Francisco Offices & Factory
18th and Alabama Streets

Gas *for* Cooking Has *a* Romantic Past

(Continued from Page 70)

ing by gas—that is, pieces of iron so placed as to hold different things, but I believe that Mr. Arthur King of Liverpool arranged the first convenient apparatus for cooking by gas."

Six years later an abstract from the original minutes of the Middlesborough, England, Corporation gas department, ran as follows: "Mr. Avery has applied for a supply of pipes from the gas works to his hotel to enable him to use gas in the day for cooking. A committee agreed to lay the pipe so soon as the apparatus is ready, providing Mr. Avery will guarantee a reasonable additional consumption to warrant the outlay." Evidently gas at that time was shut off in the town during the day, and this is a request for a continuous supply of gas for cooking.

GAS MERCHANDISING BEGINS

The first advertisements for gas stoves and cooking apparatus appeared in the American Gas Light Journal, July 1st, 1859. A range with a porous burner, on the surface combustion principle, was exhibited in the fair of the American Institute at New York in 1859. The Providence, Rhode Island, Gas Company has the distinction of having opened in 1873 the first gas appliance store.

One of the pictures shown with this article is of the first gas range built in the United States, sometime in 1840. The burner consisted of a ring of iron filled with sand and placed on a wire screen. Gas was sent through the screen and ignited on top of the sand.

In some respects modern gas range manufacture is not far removed from the pioneer stage. The modern enamel range is practically a duplication of the old original high oven ranges. The only difference is that the steel parts and in some cases the castings have been enameled. It is apparent that most of the stove manufacturers have made very little effort to design a gas range to meet the new condition of enameling. If the manufacturers would go into this matter, I am convinced that they could eliminate a great deal of grief and expense, not only for themselves in the way of replacements and a large amount of second parts which they get out of the enameling furnace, but also the grief of chipping which the retailer has to contend with on his sales floor and in the hands of the consumer.

RANGE MANUFACTURE IN ENGLAND

It is of interest to note some of the gas ranges that are now in use at the present time in England. The peculiar top burners and the broiler arrangement are especially to be noticed.

A prominent ad of an English gas journal, dated March 9th, 1924, gives some idea of English tendencies in range manufacture. The advertisement is apparently describing the first attempt to manufacture a high oven or cabinet range such as we are familiar with. Quoting the "ad" copy: "The complete departure from the design of all existing models of our gas cookers evidenced in Wright's new eye-level cooker, requires but a glance for its full justification. You have under the eye, on one level, all the operations of cooking the various parts of the dinner, making this task very much simpler and quicker. The stooping, the lifting of heavy joints, etc., and the necessity of standing in front of a heated oven to manipulate pans on the hot plate, are entirely obviated.

Note the pan or grill work underneath the range."

The picture accompanying the above advertisement is the first that I have been able to find of an English range, featuring the oven heat control.

The California National Supply Company, 147-149 No. Los Angeles St., Los Angeles, will henceforth be known as the National Supply Company of California.

Pacific Coast Natural-Gas Gasoline Plants, Operators

J. W. MASHAW
United States Bureau of Mines

NATURAL-GAS GASOLINE PLANT OPERATORS

COMPANY	ADDRESS	No. of PLANTS
Ahlberg Gasoline Company	Brockman Bldg., Los Angeles	1
Ahlberg Gasoline Corporation	Brockman Bldg., Los Angeles	1
American Gas Company	Box 91, Orcott, Calif	1
American Gasoline Corporation	Transportation Bldg., Los Angeles	2
Associated Oil Company	79 New Montgomery St., San Francisco	1
Balel Gasoline Company	Higgins Building, Los Angeles	1
Bankline Oil Company	310 Sansome St., San Francisco	1
Belridge Oil Company	Bank of Italy Bldg., Los Angeles	3
Brea Canyon Oil Company	Standard Oil Bldg., Los Angeles	1
California Gasoline Company	Security Building, Los Angeles	5
California Petroleum Corporation	Security Building, Los Angeles	5
Calumet Oil Company	I. W. Hellman Bldg., Los Angeles	1
Central Oil Company	H. W. Hellman Bldg., Los Angeles	2
Cowan Oil & Refining Company	Merchants Nat'l Bank Bldg., Los Angeles	1
Export Refining Company	Higgins Bldg., Los Angeles	1
Fellows Gasoline Company	2455 E. 27th St., Los Angeles	3
O. C. Fields Gasoline Corporation	Board of Trade Bldg., Los Angeles	1
Fullerton Oil Company	Merchants Nat'l Bank Bldg., Los Angeles	1
General Petroleum Corporation of Calif	Higgins Bldg., Los Angeles	5
Gilmore Oil Company	2423 E. 28th Street, Los Angeles	3
Gralan Oil Company	Box 3237, Taft, Calif	1
Guardian Gasoline Company	Board of Trade Bldg., Los Angeles	1
Holly Oil Company	Bin "B", Huntington Beach	1
Honolulu Consolidated Oil Company	215 Market St., San Francisco	1
Interstate Oil Company	Hibernian Building, Los Angeles	1
La Habra Gasoline Company	Haas Bldg., Los Angeles	4
Lomita Gasoline Company	Box 669, Long Beach	1
Lovell Gasoline Corporation	Higgins Building, Los Angeles	5
Montebello Oil Company	Security Building, Los Angeles	1
Mutual Gasoline Company	Hollingsworth Bldg., Los Angeles	1
North American Oil Consolidated	351 California St., San Francisco	1
Norwalk Company	Higgins Building, Los Angeles	1
Olig Crude Oil Company	Walker Auditorium, Los Angeles	1
Olinda Gasoline Company	Union League Bldg., Los Angeles	2
Pacific Gasoline Company	California Bank Bldg., L. A.	28
Pacific National Gasoline Company	Pacific Mutual Bldg., L. A.	4

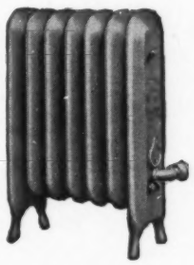
POTTER Heating

For many years POTTER Engineers have pioneered the way in the advancement of modern Gas Heating Systems. They have developed Gas Heating to such a degree of perfection that today, POTTER Products have become a standard of comparison wherever dependable, safe, economical and healthful gas heating is discussed.

OUR BEST ASSET

The tens of thousands of satisfied customers that our Organization has made through POTTER Gas Heating installations, is a JUST tribute to a satisfactory product—a gratification to conscientious effort.

THERE ARE MANY REASONS WHY IT IS BETTER TO INSTALL POTTER SYSTEMS

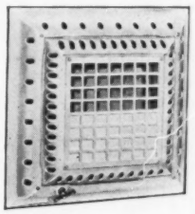


"POTTER" Vented Radiators

Only POTTER has these 7 POTTER Features

(Cast Iron and Steel-Made)

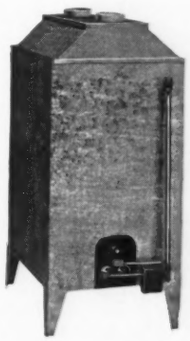
1. Condensation abolished. This does away with corrosion. Many years are added to the life of the Radiator.
2. Triple Circulation. The heat goes into the room, not up the flue.
3. Uniform warmth distribution. The air is never "cooked."
4. Quick heat. No other radiator heats so quickly as the light, efficient POTTER Steel-Made.
5. Aristocratic appearance. The POTTER Cast Iron Radiator is selected for the finest and largest homes.
6. Totally odorless always.
7. Not expensive.



"COLE" Floor and Wall Heaters

Made in heavy solid cast aluminum.

COLE is the only furnace manufactured that can be installed on either the first or second floor.



"MAGIC WAY" FURNACES

"MAGIC WAY" was the first, and has always been considered the leading Unit System of heating.

The principle of Unit Heating of modern buildings, brought to its present state of refinement through the study and efforts of this Organization, is based on the principle of an individual furnace or heater for each room or group of rooms to be heated.

This type of installation allows accurate temperature control in each room, regardless of the demand in other sections of the home.

POTTER quantity production now makes "MAGIC WAY" with electric controls, available to anyone who desires a gas furnace system.

The same features that make these well known POTTER-made appliances favorites with home builders and home owners, make them popular with churches, schools, theatres, auditoriums and factories.

The low cost of adequate heating by means of "MAGIC WAY" Vented Furnaces of either the Unit or Central Plant type, will be a revelation.

"MAGIC WAY" VALVES

By merely pressing a button, the temperature of any room may be regulated. This valve not only turns the heat on but it regulates the heat to suit your exact wants.

"MAGIC WAY" Floor Furnace

When the furnace type of heat is desired at low cost or when a basement is not available, use "Magic Way" Vented Floor Furnaces.

Potter Heating Includes:

"MAGIC WAY" UNIT FURNACES
"POTTER" GAS RADIATORS
"STEEL-MADE" GAS RADIATORS
"COLE" FLOOR AND WALL FURNACES

There Is a **POTTER System** for Every Need

POTTER RADIATOR CORPORATION

San Francisco—Oakland—Los Angeles—San Diego

Braasch hot fin Furnace

BUILT ON THE FRANKLIN AIR COOLED ENGINE PRINCIPLE

EASY SELLER

Phone GLadstone 1904 for agency proposition.

A. J. Braasch Heater Company

1041 North Orange Drive

Hollywood, California

Pan American Petroleum Company	Petroleum Securities Bldg., Los Angeles	4
Petroleum Securities Company	Petroleum Securities Bldg., Los Angeles	1
Producers Gasoline Corporation	Commercial Exchange Bldg., Los Angeles	3
Rancho La Brea Oil Company	California Bank Bldg., Los Angeles	1
The Redondo Company	Torrance, Calif	1
Reservoir Hill Gasoline Company	605 Nebraska Avenue, Long Beach	1
Rex Gasoline Corporation	C. C. Chapman Bldg., Los Angeles	1
Rice Ranch Oil Company	548 S. Spring St., Los Angeles	1
Richfield Oil Company	A. G. Bartlett Bldg., Los Angeles	1
Rio Grande Oil Company	Spreckles Bldg., Los Angeles	1
Ryan & Hackett	Pacific Mutual Bldg., Los Angeles	2
Sandome Gasoline Company	Box 827 Santa Fe Springs, Calif.	1
Sentinel Oil Company	Pacific Southwest Bank Bldg., Los Angeles	2
Shell Company of California	200 Bush Street, San Francisco	7
Signal Hill Gasoline Company	A. G. Bartlett Bldg., Los Angeles	2
Signal Gasoline Company, Inc.	C. C. Chapman Bldg., Los Angeles	2
Signal Gasoline Corporation	C. C. Chapman Bldg., Los Angeles	2
Standard Oil Company of California	225 Bush St., San Francisco	17
St. Helens Petroleum Co., Ltd.	S. Broadway Bldg., Los Angeles	3
St. Helens Riverside Properties	S. Broadway Bldg., Los Angeles	1
The Petroleum Company	Sun Building, Los Angeles	1
Torrance Gasoline & Refining Co.	Union League Bldg., Los Angeles	1
Union Oil Company of California	Union Oil Bldg., Los Angeles	9
United Oil Company	A. G. Bartlett Bldg., Los Angeles	2
U. S. Royalties	Marsh Strong Bldg., Los Angeles	1
West Coast Refining Company	Pacific Finance Bldg., L. A.	1

PACIFIC COAST NATURAL-GAS GASOLINE PLANTS

Explanation of Symbols

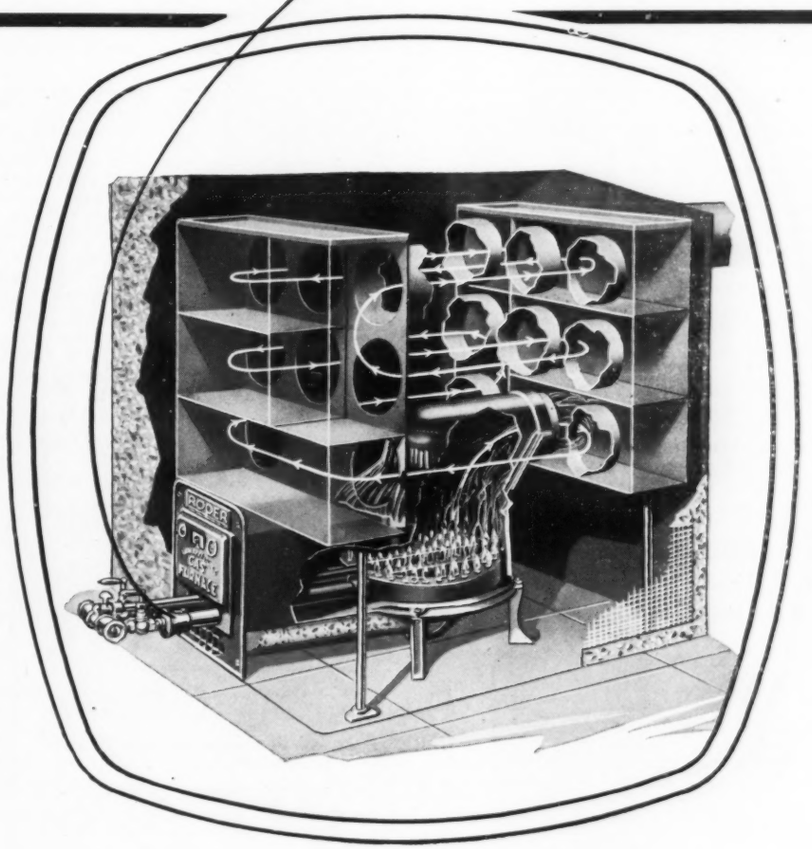
Abs. ..... Oil Absorption Plant
Bstr. ..... Booster Plant
Char. ..... Charcoal Absorption Plant
Comb. ..... Combination Compressor and Oil Absorption Plant
Comp. ..... Compressor Plant
O. & C. Abs. ..... Combination Oil & Charcoal Absorption Plant

LOCATION	COMPANY	DAILY CAPACITY (M.C.F.)	TYPE OF PLANT	STATUS
BELRIDGE—LOST HILLS FIELD				
Belridge Lease	Belridge Oil Company	5,000	Abs.	Op.
Belridge Lease	Belridge Oil Company	5,000	Abs.	Op.
Cahn	Standard Oil Co. of California	550	Comb.	S.D.
COALINGA FIELD				
Sec. 26	Shell Company of California	4,000	Abs.	Op.
COYOTE HILLS FIELD				
Brea Olinda Lease	Brea Canyon Oil Company	2,000	Comb.	Op.
Brea Canyon Lease	Fullerton Oil Company	3,100	Comb.	Op.
Tonner	General Petroleum Corporation of Cal	10,000	Abs.	Op.
Assoc. AWW No. 2 Lease	Hurley Smith Company	1,500	Abs.	S.D.
Assoc. Hulade Lease	La Habra Gasoline Company	5,000	Comp.	S.D.
Graham & Loftus	La Habra Gasoline Company	5,000	Abs.	Op.
Union-Hole Lease	La Habra Gasoline Company	5,000	Abs.	S.D.
C. C. M. C. Lease	Olinda Gasoline Company	1,500	Comp.	Op.
C. C. M. O. Lease	Olinda Gasoline Company		Bstr.	Op.
Birch Lease	Pacific Gasoline Company	900	Abs.	Op.
Columbia Lease	Shell Company of California	2,000	Abs.	Op.
Grazide Lease	Shell Company of California	10,000	Abs.	Op.
Murphy-Coyote	Standard Oil Co. of California	11,518	Comb.	Op.
Johnson Lease	St. Helens Petroleum Co., Ltd.	2,500	Abs.	Op.
Gilman Lease	The Petroleum Company	300	Abs.	Op.
Stearns No. 2	Union Oil Company of California	3,500	Abs.	Op..
Stearns No. 3	Union Oil Company of California	10,000	Abs.	Bldg
DOMINGUEZ FIELD				
Callender Lease	American Gasoline Corporation	8,000	Abs.	Op.
De Francis & Marland	Pacific Gasoline Company	2,500	Abs.	Op.
Reyes	Shell Company of California	20,000	O & C Abs.	Op.
Hellman Lease	Union Oil Company of California	28,500	Abs.	Op.
P. E. Station	U. S. Royalties		Abs.	Op.
ELK HILLS FIELD				
Sec. 34-S	Belridge Oil Company	4,000	Abs.	Op.
Sec. 35-S	Pacific Gasoline Company	7,500	Abs.	Op.
Sec. 31-S	Pacific Gasoline Company	5,000	Abs.	Op.
Crampton K Lease	Pan American Petroleum Co	15,000	Comb.	Op.
Sec. 34-30-24	Pan American Petroleum Co	9,000	Bstr.	Op.
Hay Property	Standard Oil Co. of California	3,910	Comb.	Op.
Tupman Property	Standard Oil Company of California	1,013	Comb.	S.D.
HUNTINGTON BEACH FIELD				
Savage	California Petroleum Corporation	3,000	Abs.	Op.
Central Lease	Central Oil Company of L. A.	250	Abs.	Op.
Holly Dev. Lease	O. C. Fields Gasoline Corporation	6,000	Abs.	Op.
Holly Lease	Holly Oil Company	4,000	Comb.	Op.
Assoc.-Fowler Lease	Pacific Gasoline Company	5,000	Abs.	Op.
Assoc.-Miley-Keck	Pacific Gasoline Company	5,500	Abs.	Op.
A-B-D	Standard Oil Company	14,280	Comb.	Op.
Copeland Lease	Union Oil Company of California	5,000	Abs.	Op.
Republic Lease	United Oil Company	2,500	Abs.	Op.
INGLEWOOD FIELD				
Shell-Rindge Lease	American Gasoline Corporation	4,500	Abs.	Op.
Assoc.-Vickers	Pacific Gasoline Company	6,500	Abs.	Op.
P. O. Baldwin Lease	Pacific Gasoline Company	3,750	Abs.	Op.
Rubel Lease	Petroleum Securities Company	11,000	Comp.	Op.
L.A.I. No. 1	Standard Oil Company	14,380	Comb.	Op.
LONG BEACH FIELD				
35th and Lime	Ahlberg Gasoline Company	8,000	Abs.	Op.
35th and Pine	Ahlberg Gasoline Corporation	8,000	Abs.	Op.
Plant 1	California Gasoline Company	4,000	Abs.	Op.
Plant 2	California Gasoline Company	6,000	Abs.	Op.
Plant 3	California Gasoline Company	4,000	Abs.	Op.
Plant 6	California Gasoline Company	10,000	Abs.	Op.
Herlow Kent Lease	California Petroleum Corporation	7,500	Abs.	Op.
"A"	Fellows Gasoline Company	25,000	Abs.	Op.
Walnut and Hill Streets	General Petroleum Corp. of Cal	5,000	Abs.	Op.
Gilmore Lease	Gilmore Oil Company	10,000	Abs.	Op.
Jergins City Lease	Lomita Gasoline Company	10,000	Abs.	Op.
	Mutual Gasoline Company	10,000	Char.	Op.
L. B. No. 1	Pacific Gasoline Company	3,000	Abs.	Op.

(Continued on Page 86)

A Big Profit Opportunity

Automatic Control—just press the button.



The Roper High Efficiency, Gas Fired, Warm Air Furnace offers you a double profit sales opportunity.

1. **Profit from the sale of furnaces.**
2. **Profit from the increased consumption of gas for heating.**

The proven superiority of the Roper Gas Furnace is attested by thousands of users. Its remarkable design—a design originally developed through the combined efforts of 20 leading gas engineers—its efficiency, safety, cleanliness, servicability, automatic control, and economy, together with the great facilities and experience of the Roper organization, will speed the day for the universal use of Gas as THE fuel for home heating.

By starting now, with the merchandising of the Roper High Efficiency, Gas Fired, Warm Air Furnace means you are getting in on the ground floor of an unusual opportunity.

A type of furnace for every need

Geo. D. Roper Corporation
Rockford, Illinois
Pacific Coast Branch,
135 Bluxome Street
San Francisco, Calif.

ROPER
TRADE MARK
HIGH EFFICIENCY WARM BABCOCK AIR GAS FIRED
FURNACE

Coupon

Geo. D. Roper Corporation, Rockford, Ill. WG. 8

Please send complete information about the Roper High Efficiency, Gas Fired, Warm Air Furnace.

Name .....

Address .....

City..... State.....

Natural Gas Outlook *in* Montana *is* Promising, Says Geologist

By J. P. Rowe
Professor of Geology, University of Montana

WRITING UNDER RECENT DATE *in the "Anaconda Standard," J. P. Rowe, professor of geology at the University of Montana, discusses natural gas and petroleum production in that state. An exerpt from his remarks, given below, summarizes the present commercial extent of natural gas utilization in Montana.*

MONTANA bids fair to become rather a large producer of natural gas. At present there are a number of localities in the state where gas has been struck but not yet used in a commercial way. Natural gas is a great boon to those in Montana who have it accessible. The heat value of natural gas and artificial gas is more than two to one in favor of the natural product. The matter of price is also a big factor. The city of Billings pipes its natural gas about 68 miles and sells it for 50 cents per thousand cubic feet, as against $2.20 per thousand paid for artificial gas at Missoula.

At present there are nearly a dozen cities in Montana using natural gas and about that many localities that produce natural gas in large enough quantities to be commercially valuable. The following are some of the cities using natural gas:

Glendive—Gas was discovered and used in this city for the first time in 1913. Glendive also has the distinction of being the first city in Montana to use commercially natural gas. The wells are on the northern end of the Cedar Creek anticline.

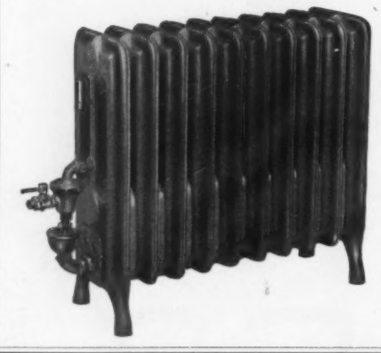
Baker gets its supply of gas from this same general structure. Baker has 13 gas wells and charges 30 cents per thousand cubic feet.

Havre is the second city in the state to use natural gas. The gas comes from the Eagle sandstone or from the base of the Montana formation.

Billings at present does not get its gas exactly from Montana, but it comes from Elk Basin, and as this structure is partially in Montana it might be said that Billings gets its gas partially from Montana territory. The gas is piped 68 miles and in addition to Billings, the towns of Bridger, Laurel and others are also supplied. Billings might be able in the near future to secure her natural gas from the Big Lake district, as there are several producing gas wells already drilled in this structure.

Shelby and one or two other small towns in the northern part of the state use natural gas supplied from wells in the Kevin-Sunburst field. There are listed 29 gas wells in this field.

THE LATEST



Hammel

Gas Steam Radiators

Unit System of Heating—Steam Heat in Ten Minutes

WE ARE now able to offer some very profitable territory to dealers who can qualify. The *Hammel* line offers a very liberal profit and its repeat orders will build a substantial business for you.

Good Territory for Live Dealers
Write for Literature

Hammel Radiator Corporation
715 So. Figueroa St. Los Angeles

JNO. W. CRAWFORD
SALES ENGINEER
1855 Industrial Street Phone TUcker 7213
LOS ANGELES, CALIFORNIA

THE CHAPLIN-FULTON MFG. CO.
Fulton High and Low Pressure Gas Regulators, Back Check and Vacuum Regulators, Gas Fuel Boiler Governors, VIGILANT Feed Water Regulators, Boiler Feed Pump or Tank Governors, Steam Reducing Valves and Absorber Tank Regulation.

MODERN MFG. COMPANY
Perforated Hanger Iron, Pipe Hangers, Floor and Ceiling Plates.

JAS. P. MARSH & COMPANY
Gauges for all pressures and purposes. Kunkle Pop. Safety and Relief Valves. Ellison Differential Draft Gauges. Power Plant and Recording Thermometers.

KIELEY & MUELLER, INC.
Steam, Water and Air Specialties, for Power Installations, Pressure Regulating, etc.

HOWARD IRON WORKS
Guided Expansion Joints.

A Live Sales Policy *in a* Small Company

(Continued from Page 49)

boys and many looked at and asked questions about the ranges. This contest was held on our discount date for gas bills. Thus we tool *full* advantage of everything.

After the boys finished we had a prominent baker come in and judge the biscuits so as to get his interest. As prizes we awarded a Scout hatchet, a flashlight, and a Scout knife. These prizes were presented the following week at the Court of Award at the County Courthouse, the Executive Council asking the writer to present the prizes.

"EVOLUTION" WINDOWS APPEAL

In conjunction with this work, our three windows were trimmed to show the evolution of fuel. The first window was trimmed with fir trees, moss, and stones, with a camp fire scene and an old blackened pot to indicate all the labor of the open fire cooking. Another window had an old wood range with the incident mess of papers, kindling, slat wood, and ashes. Then the third window showed an enamel Tappan range in an immaculate setting to indicate the comfort, cleanliness, and temperature control of a modern gas range.

The camp scene was a means of one sale, as the buyer told the following story to our installation men when they were setting up the range. The evening before, the lady's husband and little girl were riding in their automobile by the gas company office. The little girl saw the camp window and asked her father to stop so that she could get out to look at it. They stopped, the little girl came to the window and after looking at the camp scene, called for her folks to come. The lady said they got out, looked at the camp scene, then followed the other windows to the modern range. The range looked so good that the next day the parents came in and ordered the "Modern" range. Thus it was demonstrated that in appliance selling, as in the Bible story of old, "Even a child shall lead them." Incidentally it may be noted that our "Evolution of Fuel" windows were awarded first place in the National Window Display contest.

The activities have not been confined to any one set of appliances, but to clubs, restaurants, and schools. During the past year, five gas fired power boilers have been added to our load. Modern equipment has been installed in the kitchen of the Elk's Home, three restaurants have been converted to gas along with many minor installations. Last summer the new North Junior High School was completed by the city, and in the Domestic Arts Department, under the supervision of Mrs. Kantner, eight gas ranges were installed. Thus the pupils are caught young.

REPLACEMENT IS BIG PROBLEM

We feel that our big problem is to see that the public is thoroughly informed concerning modern equipment, that old appliances should be watched and replaced with new as far as practical. This condition will hit other companies sooner or later. If the gas company does not try to see that new gas appliances replace worn out equipment, our growing competitor will make it hot for us. While he can not offer the speed, durability, or dependable service, he will offer a far better article than the old worn out gas range. Then we will get the medicine that we handed the coal and wood stove.

So in summing up our situation, I believe that the motto of the gas industry hits the nail on the head—"If it is done with heat, it can be done better with gas."

TAPPAN—

Modern Perfection in Gas Range Manufacture

TAPPAN, manufacturer of quality ranges since 1881, today makes the famous **TAPPAN In-So-Top,** a gas range universally recognized as **the example** of modern perfection in gas range making.

Famous for its **insulated oven:** Twenty to twenty-five pounds of mineral wool, the finest insulation known for this purpose, completely insulate the TAPPAN oven. One-half the gas is saved; the heat is kept in the oven and out of the kitchen.

Famous for its **bowl burners and combustion chamber:** Keeping the heat right up under the cooking top, and producing perfect combustion.

Famous for its **solid-top:** A unique top, made of oil-tempered, satin-finished cast iron which will not discolor and is easy to keep clean.

Famous for its **rounded corners,** an added touch of beauty and distinction; for its **oven-heat regulator,** and for many other TAPPAN features.

The **TAPPAN In-So-Top** is winning the choice of housewives everywhere because of its modern superiorities. Write for dealer information to

H. R. BASFORD CO.

Distributors for Northern California, Nevada and Hawaii
665 Howard Street, San Francisco

Harry R. Mayer

Distributor for Southern California
1001 E. First Street, Los Angeles, Calif.

JOHN WOOD
Manufacturing Co.

Manufacturers of
The Wood Automatic Storage Water Heater

The Standard Combination Storage Water Heater

Electric Weld Range Boilers

Expansion tanks, pneumatic tanks and air receivers

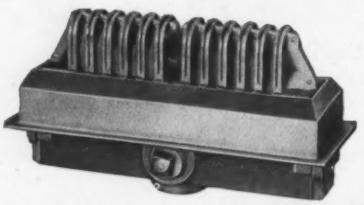
Made and Guaranteed by

JOHN WOOD
Manufacturing Co.

2437 ENTERPRISE STREET LOS ANGELES, CALIF.

R. M. C. Gas Burner

Is Efficient



Is Different

ROTARY MANUFACTURING CO.
5720 LONG BEACH AVENUE LOS ANGELES, CALIFORNIA

Building Gas Consumption *Thru* Existing Services

(Continued from Page 56)

Presumably the same customers were using make-shift appliances which would not encourage the more extensive use.

The above analysis points out a few of the danger signals which should be observed by the gas industry if it is to hold its present business in the residential field. Almost without exception the above 70 customers could have been saved to gas service in its various forms had the customer been given attention and service at the proper time.

MORE EXTENSIVE USE

The last and very important consideration toward increased consumption of gas on existing services and meters is the more extensive use of gas equipment on the customer's premises. The growing tendency to live away from home, take meals at restaurants, use prepared foods, and live in hotel apartments has made serious inroads into residence consumption of gas.

In order to determine the actual conditions in the home with reference to the use of gas equipment and the attitude of the housewife toward the more common household duties, a special survey was made of 69 representative homes.

On the theory that more gas could be consumed in the home for cooking if the housewife was better versed in home economics and enjoyed doing more home cooking, the 69 housewives included in the survey were questioned regarding their attitude and customary practice along the following lines:

49 do own laundry.
40 enjoy doing home cooking.
16 bake their own bread—all or part.
63 bake pastry in the home.
24 do oven canning.
6 employ help for cooking.
21 would do more cooking if equipment were better.
36 families take some meals out.
7 families breakfast out.
23 families buy lunches.
23 families buy dinners at restaurants.

A total of 1700 meals are bought out monthly. (This does not include the regular downtown lunches of business men.)

Notwithstanding the increased number of gas appliances in homes there has been little increase in the total consumption of gas per customer. There must be a reason for this. A study of the situation clearly shows that families are living away from home more than they used to, taking more meals out and depending on outside agencies to do the work, which was formerly done in the home. All this obviously means less gas consumed by the residence customer.

What can the gas company do to encourage a larger use of better gas appliances in the home? Only through advertising, publicity and personal contact can we hope to get our message across successfully to the customer.

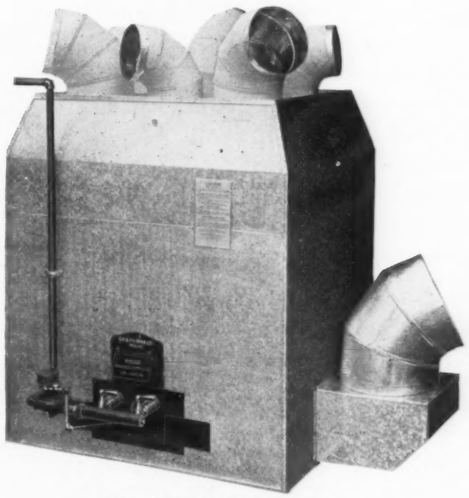
The logical contact between the gas company and the customer in the interest of better equipment and its more extensive uses is through a well organized home service department.

The Portland Gas & Coke Company Home Service Department this year conducted a series of 14 free cooking schools sponsored by local community newspapers and one large downtown school sponsored by a large daily paper.

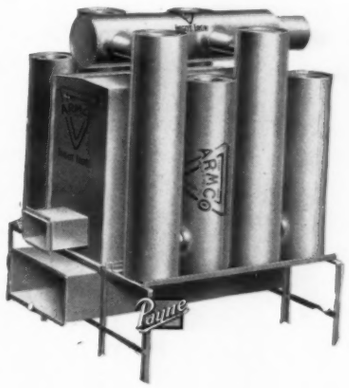
The cooking schools were not commercialized in any sense. The food supplies were

The HOUSE HEATING PROBLEM *of the* GAS COMPANY

What Appliances to Sell or What to Approve



The Payne Gas Furnace



Interior of the New 1926 Improved Model Shown at Left.

THIS PROBLEM is approached by the Gas Companies in one of two ways—

1. **By SELLING appliances direct to their consumers.**
2. **By APPROVING appliances sold by local dealers.**

We understand the extremely high standards set by the Gas Companies and have built PAYNE GAS FURNACES to this standard for more than twelve years. They have been constantly improved till now the 1926 model is a truly wonderful furnace—economical, durable and dependable.

We are most anxious to be of real assistance to Gas Company executives who are interested in taking on the house heating load in such a way as to make lasting friends for their company. We are in position to assist direct or through our many local dealers. Please send coupon below to open up the avenue of real constructive co-operation and profit.

☐ We are interested in the merchandising of gas appliances.

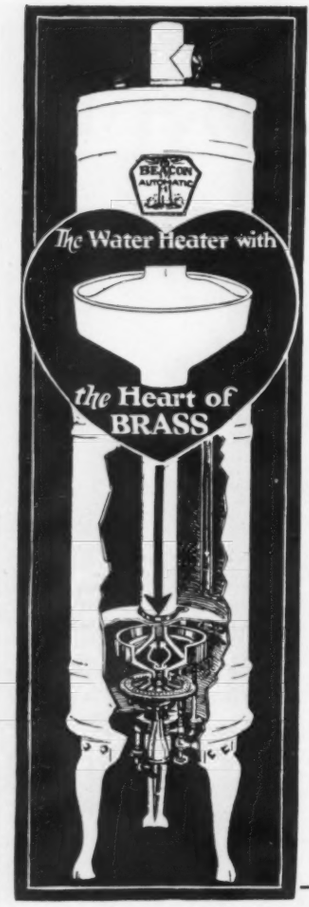
PAYNE FURNACE & SUPPLY CO. INC.

Main Office, 338 Foothill Road, Beverly Hills.
Branch, 2247 Grove St., Oakland, Calif.

☐ We are interested in approving good appliances sold by local dealers.

Firm..... Attention Mr. .....

Address.....



Beacon

Automatic Storage Water Heater

Used With the Highest Satisfaction by Gas Companies

The BEACON is a heavy duty appliance. High grade materials are used throughout. The boiler is made of heavy gauge galvanized iron and all seams are both riveted and welded. Brass heating element has six times the heat conductivity of iron. Keeps water clean.

Beacon Water Heater Co.

776 So. San Pedro St.

Los Angeles, California

BEAUTIFUL
PALAIS ROYAL
Direction: J. C. Bendrodt Ltd.—Geo. C. Irving
'Phones Padd. 199
PAVLOVA
Patrons said it was
Too Hot at Palais Royal!!
We turned on 26 Giant Subterranean Electro-gas Furnaces and 250 small Electric Heaters, and at 9.30 on Tuesday and Friday last a perspiring house asked us to turn them off.
That's how we beat Old King Winter at Palais Royal
At a colossal cost we have at last succeeded in making Palais Royal warm and comfortable on the coldest night. No need to seek
Nowada
dance
Because Palais
and beauty and
requirements of
dance band. Palai
place that lagged
Pride of
GIANT PAL
ROYAL
this winter is more than ever a Giant among D
vous.
(1) Giant Electrogas Furnaces keep you warm.
(2) Giant inter-city parlor coaches, costing more than £3500 each, carry you to and fro if it rains.
(3) Giant service and space make you comfortable.
(4) Giant decorations and illuminations amaze you.
(5) That giant among orchestras, Palais Royal Californians.

(Reduced reproductions of advertisements from Sydney, Australia, papers, May, 1926)

The original installation of 500 small electric heaters was inadequate to properly heat the immense "Palais Royal." After thorough investigation, the management installed 26 large Electrogas floor furnaces, which, together with 250 of the original electric heaters, gave ample heat. If you are not fully acquainted with the three sizes of Electrogas, we will mail details. Electrogas Furnace Co., Rialto Bldg., San Francisco.

bought and paid for by the gas company as were all other expenses incidental to the school. The 14 suburban schools showed a total attendance of 6180 or an average of about 440 at each school.

Too much attention cannot be given to domestic science departments of the public schools. Realizing that the school children are forming permanent impressions of cooking methods and equipment, it is very important that the schools use modern gas equipment for their laboratory work.

On the whole larger consumption of gas through existing services and meters can be accomplished through a well balanced program of home economics work, supported by quality service, good appliances, and an aggressive sales organization.

Company-Employee Relations

(Continued from Page 67)

of the promotion problem in large organizations.

Pension systems would seem to be the only logical method of rewarding long and faithful service. Such plans should be fundamentally sound, however, for their failure or abandonment is a serious thing in its effect on the morale of an organization.

Industry is pretty generally sold on safety work as a matter of good business. We believe that medical examination of new employees is equally good business. It is particularly essential where pension, disability or other benefit plans exist.

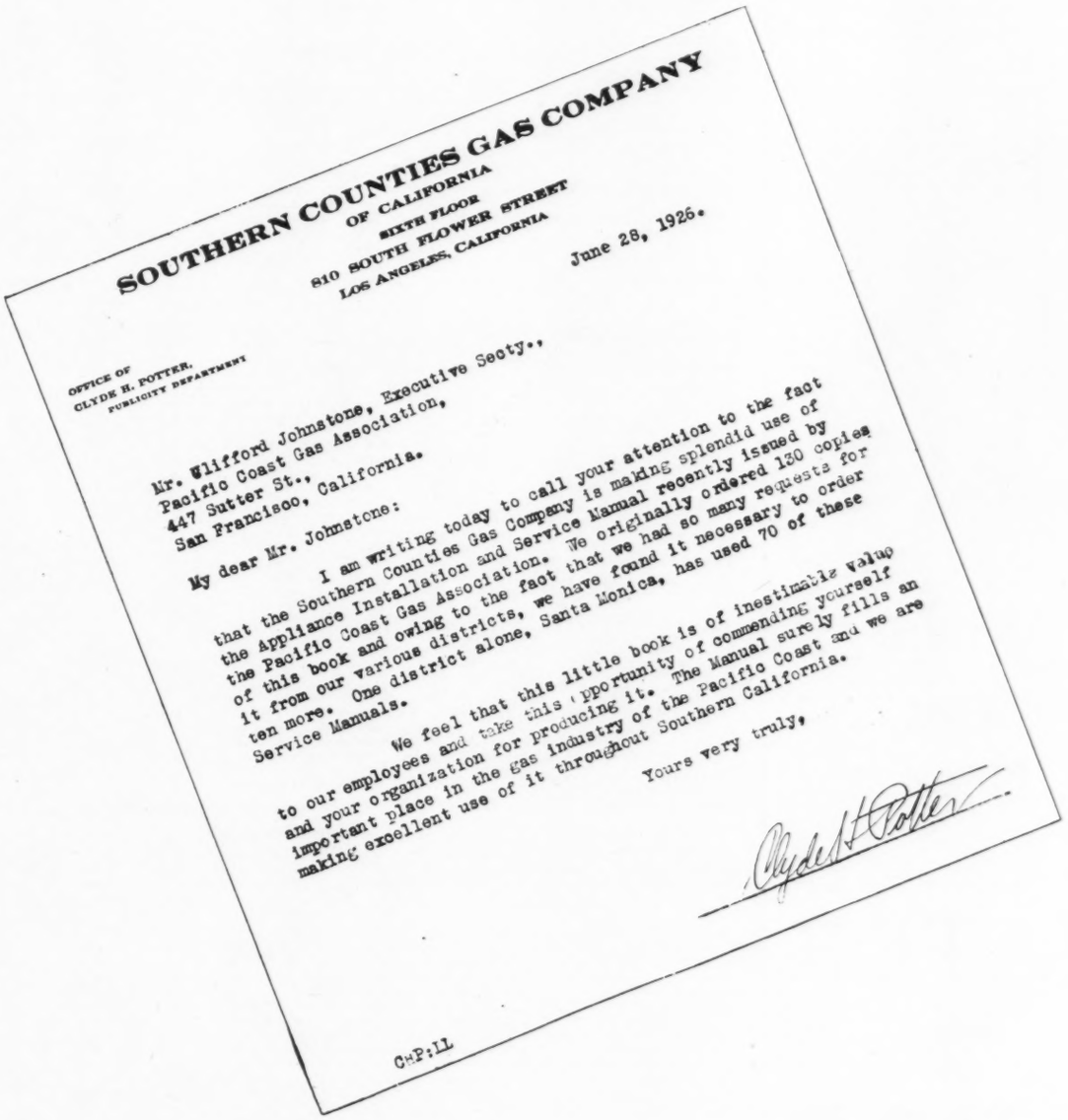
All human beings like to be recognized as individuals and the problem of preserving the personal contact between employer and employee is one of the most vital and most difficult of industrial problems. Employee representation is gaining favor in the east as a means of reconciling the industrial group system with the basic individualistic principles of Americanism. We suggest that the adoption of any such method should come about through a process of evolution. In the meantime other means have proved quite effective.

Industrial relations or personnel departments can interpret management to employee and employee to management and stand to some extent in the position of referee and court of appeal. Group meetings, social, recreational and educational, are also a valuable aid in holding the personal contact. We believe, however, that paternalism should be avoided and that employees should be encouraged to handle their own activities along these lines through clubs or associations. Through such associations management can contribute to welfare and educational work without the undesirable paternalism.

Disability insurance and other benefits are best handled by the employees themselves through mutual benefit associations. Employee stock ownership on the other hand encourages thrift and gives the employee a sense of partnership and of sharing in the development of the company.

We believe that utility employees should be given the advantage of reduced rates for service and appliances. It would appear, however, that any wholesale use of a company's purchasing power for the advantage of its employees might prove detrimental to the company's standing in the community. Loans to employees should be discouraged and only made in cases of extreme emergency.

If employees are given the opportunity to develop, are helped to develop, are recognized as individuals and are treated with fairness and consideration, loyalty and cooperation must come as a natural result.



SOUTHERN COUNTIES GAS COMPANY
OF CALIFORNIA
SIXTH FLOOR
810 SOUTH FLOWER STREET
LOS ANGELES, CALIFORNIA

June 28, 1926.

OFFICE OF
CLYDE H. POTTER,
PUBLICITY DEPARTMENT

Mr. Clifford Johnstone, Executive Secty.,
Pacific Coast Gas Association,
447 Sutter St.,
San Francisco, California.

My dear Mr. Johnstone:

I am writing today to call your attention to the fact that the Southern Counties Gas Company is making splendid use of the Appliance Installation and Service Manual recently issued by the Pacific Coast Gas Association. We originally ordered 130 copies of this book and owing to the fact that we had so many requests for it from our various districts, we have found it necessary to order ten more. One district alone, Santa Monica, has used 70 of these Service Manuals.

We feel that this little book is of inestimable value to our employees and take this opportunity of commending yourself and your organization for producing it. The Manual surely fills an important place in the gas industry of the Pacific Coast and we are making excellent use of it throughout Southern California.

Yours very truly,

Clyde H. Potter

C.H.P:LL

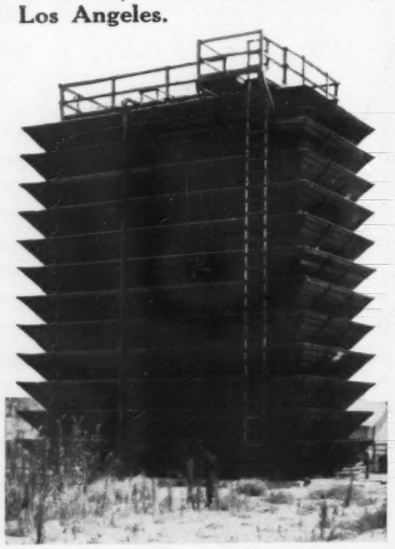
There Are Only a Few Copies Left

Packet size (4½x7) illustrated, heavy paper cover.

To P. C. G. A. members.....$1.00 postpaid
To non-members .....$1.50 postpaid

PACIFIC COAST GAS ASSOCIATION
447 Sutter Street, San Francisco

Visit our exhibit at the Chamber of Commerce Industrial and Trade Exposition, August 16th to 22nd, Shrine Auditorium, Los Angeles.



When You Need

COLD WATER

Buy the

FLUOR

ATMOSPHERIC COOLING TOWER

FOR REAL SATISFACTION

FLUOR CONSTRUCTION CO.

Constructors and Engineers

707 Van Nuys Bldg.

Los Angeles, Calif.

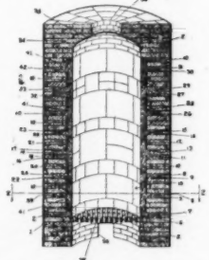
Pacific Coast Natural-Gas Gasoline Plants, Operators

(Continued from Page 78)

LOCATION	COMPANY	DAILY CAPACITY (M.C.F.)	TYPE OF PLANT	STATUS
L. B. No. 2	Pacific Gasoline Company	5,000	Abs.	Op.
Cherry St. No. 3	Pacific Gasoline Company	50,000	Abs.	Op.
American Avenue	Pacific National Gasoline Company	6,000	Abs.	Op.
Temple and Arbelle Street	Pan American Petroleum Company	2,500	Comb.	Op.
Ramsel Lease	Reservoir Hill Gasoline Company	9,000	Abs.	Op.
	Rex Gasoline Corporation	5,000	Abs.	Op.
Interstate Lease	Ryan & Hackett	1,200	Abs.	Op.
Coseboom	Shell Company of California	30,000	O & C	
			Abs.	Op.
Atlantic Avenue	Signal Gasoline Company, Inc.	10,000	Abs.	Op.
Plant No. 1	Signal Gasoline Corporation	6,000	Abs.	Op.
Plant No. 2	Signal Gasoline Corporation	6,000	Abs.	Op.
United-Haas Lease	Signal Hill Gasoline Company	5,000	Abs.	Op.
United-Denni	Signal Hill Gasoline Company	3,000	Abs.	Op.
	MIDWAY FIELD			
Assoc.-26B	Associated Oil Company	2,800	Abs.	Op.
Balboa Lease	Balel Gasoline Company	4,000	Abs.	Op.
Gralan Lease	Gralan Oil Company	400	Abs.	Op.
Honolulu Lease	Honolulu Consolidated Oil Company	30,000	Comb.	Op.
Cal.-Pet. Pl. No. 6	Lovell Gasoline Corporation	2,500	Comb.	Op.
North Amer. Cons.	Lovell Gasoline Corporation	3,000	Comb.	Op.
Boston Pac. Lease	Lovell Gasoline Corporation	2,000	Abs.	Op.
Sec. 28-B	North American Oil Consolidated		Abs.	Op.
Sec. 32-31-23	Olig Crude Oil Company	50	Abs.	Op.
Midway	Pacific Gasoline Company	5,000	Bstr.	Op.
Puritan Lease	Pacific Gasoline Company	6,800	Abs.	Op.
Sixteen	Pacific Gasoline Company	6,500	Abs.	Op.
Lakeview	Pacific Gasoline Company	6,000	Abs.	Op.
Nine D	Pacific Gasoline Company	6,500	Bstr.	Op.
Kerto	Pacific Gasoline Company	30,000	Abs.	Op.
Fellows	Pacific Gasoline Company	3,800	Abs.	Op.
29-G	Pacific Gasoline Company	6,000	Abs.	Op.
19-G	Pacific Gasoline Company	6,500	Abs.	Op.
33-G	Pacific Gasoline Company	3,000	Abs.	Op.
Derby	Standard Oil Co. of California	2,643	Comb.	Op.
Eagle Creek	Standard Oil Co. of California	509	Comb.	S.D.
McNee	Standard Oil Co. of California	8,337	Comb.	S.D.
Sec. 28	Standard Oil Co. of California	165	Comp.	S.D.
Sec. 30	Standard Oil Co. of California	469	Comp.	S.D.
King Lease	St. Helens Petroleum Co., Ltd.	2,500	Abs.	Op.
Schultz Lease	St. Helens Petroleum Co., Ltd.	2,500	Abs.	Op.
Calidon Lease	United Oil Company	1,750	Abs.	Op.
	MONTEBELLO FIELD			
Baldwin Lease	California Petroleum Corporation	1,200	Abs.	Op.
Temple Lease	Central Oil Company of L. A.	333	Abs.	Op.
Baldwin	Standard Oil Company of California	7,070	Comb.	Op.
Monterey Lease	St. Helens Riverside Properties	2,500	Abs.	Op.
	NEWHALL FIELD			
Pico	Standard Oil Company of California	243	Comb.	Op.
	RICHFIELD FIELD			
Kramer No. 2	Standard Oil Co. of California	5,740	Comb.	Op.
Morse	Union Oil Co. of Calif.	12,000	Abs.	Op.
Bradford Lease	West Coast Refining Company	8,000	Abs.	Op.
	ROSECRANZ FIELD			
G. P.-Vaughn Lease	California Gasoline Company	10,000	Abs.	Op.
Padleford Lease	Cowan Oil and Refining Company	7,000	Abs.	Op.
Athens	General Petroleum Corp. of Cal.	5,000	Abs.	S.D.
Superior Maxwell	Pacific Gasoline Company	2,000	Abs.	Op.
129 and Hill Streets	Producers Gasoline Corporation	12,500	Abs.	Op.
Miley Marland No. 2	Pacific National Gasoline Company	7,000	Abs.	Op.
Wiley Marland No. 3	Pacific National Gasoline Company	9,000	Abs.	Op.
Block K. Howard Townside	Producers Gasoline Corporation	12,500	Abs.	Op.
Marine-Rosecranz	Producers Gasoline Corporation	500	Abs.	Op.
Pac.-Petr.	Ryan & Hackett	400	Abs.	Op.
124th Street	Sentinel Oil Company		Abs.	S.D.
Rosecranz Lease	Union Oil Company of California	17,000	Abs.	Op.
	SALT LAKE FIELD			
A. F. Gilmore Lease	Gilmore Oil Company	2,000	Abs.	Ob.
Rancho La Brea Lease	Rancho La Brea Oil Company	5,000	Comb.	Op.
	SANTA FE SPRINGS FIELD			
	Bankline Oil Company	30,000	Abs.	Op.
Steinly Lease	California Petroleum Corporation	6,500	Abs.	Op.
Surbeck	Fellows Gasoline Company	25,000	Abs.	Op.
Surbeck	Fellows Gasoline Company	25,000	Abs.	S.D.
S. Fe. No. 1	General Petroleum Corp. of Cal.	20,000	Abs.	Op.
G. P. Lease	Norwalk Company	30,000	Abs.	Op.
Assoc.-Green Lease	Pacific Gasoline Company	5,000	Abs.	Op.
Elliott-Clarke Lease	Pacific Gasoline Company	20,000	Abs.	Op.
Pac. Pet. Corp.	Pacific National Gasoline Company	600	Abs.	Op.
Getty-Baker Lease	Rio Grande Oil Company	1,300	Abs.	Op.
Getty-Baker Lease	Sandoma Gasoline Company	10,000	Abs.	Op.
Santa Gertrude	Standard Oil Company of Calif.	4,970	Comb.	Op.
S. Whittier	Standard Oil Company of Calif.		Bstr.	S.D.
Bell Lease	Union Oil Company of Calif.	12,000	Abs.	Op.
	SANTA MARIA FIELD			
Brookshire Lease	American Gas Company	2,750	Comp.	Op.
Rice Ranch Lease	Rice Ranch Oil Company	1,000	Abs.	Op.
Careaga	Shell Company of California	2,000	Abs.	Op.
Newlove Lease	Union Oil Company of California	12,000	Abs.	Bldg.
	SUNSET FIELD			
Sec. 34-32-34	Gilmore Oil Company	2,000	Abs.	Op.
Transport Lease	Guardian Gasoline Company	6,000	Abs.	Op.
Sec. 36-3-24	Interstate Oil Company	400	Abs.	Op.
Ethel "D" Lease	Lovell Gasoline Corporation	2,000	Abs.	Op.
Sec. 31-E	Pacific Gasoline Company	2,000	Abs.	Op.
Sec. 32-12-24	Richfield Oil Company	2,500	Abs.	Op.
	TORRANCE FIELD			
C. C. M. O. Lease	Export Refining Company	20,000	Abs.	Op.
Superior Lease	Lovell Gasoline Corporation	6,000	Abs.	Op.

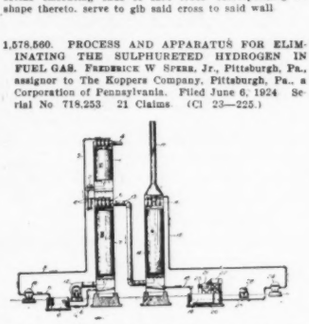
THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,581,263. FURNACE LINING. HIRAM NATHAN FREEMAN, Indianapolis, Ind. Filed May 19, 1924. Serial No. 714,359. 5 Claims. (Cl. 72—102.)



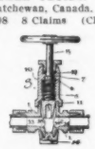
1 For wall linings, a T-shaped brick, the stem of which is adapted to serve as a coordinate brick of a conventional brick wall, the cross of said brick having its normally upper edge flush with the surface of said wall, the normally upper line of said cross being shorter than the normally lower line thereof, whereby adjoining bricks embracing ends of said cross corresponding in shape thereto, serve to gib said cross to said wall

1,578,560. PROCESS AND APPARATUS FOR ELIMINATING THE SULPHURETED HYDROGEN IN FUEL GAS. FREDERICK W SPERR, Jr., Pittsburgh, Pa., assignor to The Koppers Company, Pittsburgh, Pa., a Corporation of Pennsylvania. Filed June 6, 1924. Serial No. 718,253. 21 Claims. (Cl. 23—225.)



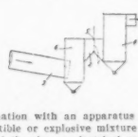
1. A process of the kind referred to for the elimination of hydrogen sulphide from coal gas, characterized by washing the air, after it has acted in the regeneration stage, with a liquid containing a freshly precipitated iron compound, to eliminate the hydrogen sulphide from said air.

1,578,849. VALVE FOR WATER, STEAM, AIR, GASES, OILS, AND OTHER FLUIDS. HORACE C. NIXON, Saskatoon, Saskatchewan, Canada. Filed Mar 3, 1919. Serial No. 280,508. 8 Claims. (Cl. 251—155.)



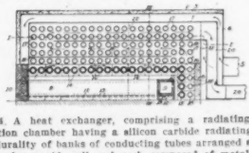
5. In combination, a valve casing, a frusto-conical valve chamber therein, a frusto-conical hollow valve in said chamber, an internally threaded barrel mounted on said casing, a threaded hollow stem rigidly attached to said valve and in cooperative engagement with said threaded barrel, means associated with said hollow stem for rotating said valve in said barrel, and a removable sand pocket below the valve and in communication with the space in the valve.

1,582,499. APPARATUS FOR ELECTRICAL PRECIPITATION OF SUSPENDED MATERIAL FROM GASES. EMIL ZOPF, Frankfort-on-the-Main, Germany, assignor to International Precipitation Company, Los Angeles, Calif., a Corporation of California. Filed Oct. 10, 1924. Serial No. 742,948. 3 Claims. (Cl. 183—7.)



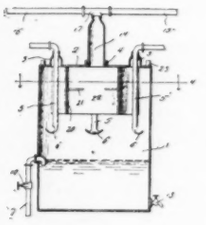
1. In combination with an apparatus adapted to produce a combustible or explosive mixture of gas and material suspended therein, an electrical precipitator, a flue connecting the aforesaid apparatus to the electrical precipitator to conduct said gases from said apparatus to said precipitator, and a screen interposed in said flue and adapted to prevent propagation of flame from said electrical precipitator to said apparatus.

1,570,674. HEAT EXCHANGER. BOYD M. JOHNSON, Metuchen, N. J., assignor to The Carborundum Company, Niagara Falls, N. Y., a Corporation of Pennsylvania. Filed Feb. 9, 1924. Serial No. 691,579. 14 Claims. (Cl. 263—20.)



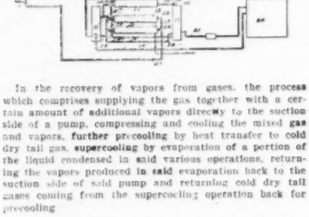
14. A heat exchanger, comprising a radiating combustion chamber having a silicon carbide radiating wall, a plurality of banks of conducting tubes arranged side by side above said wall and each composed of metal tubes and independent silicon carbide tubes arranged between said wall and the metal tubes, means for directing the gases of combustion in contact with said tubes in such manner as to subject the silicon carbide tubes of each bank to the higher temperatures, and a mixing chamber between the discharge ends of the tubes of each bank and the intake ends of the tubes of the next bank.

1,582,540. VACUUM FLOW TANK AND GAS SEPARATOR. OREN B. RIDDLE, Tulsa, Okla. Filed Feb. 18, 1925. Serial No. 8,979. 5 Claims. (Cl. 183—27.)



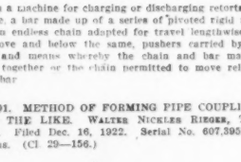
1. An apparatus for separating casing head gas from oil comprising a tank, oil supply pipes extending downwardly into the tank, and upwardly directed deflectors on the discharge end of the supply pipes for spraying the oil against the inner wall of the tank, whereby the gas is separated from the oil

1,581,212. RECOVERING GASOLINE. FRED E HOSMER, Fort Worth, Tex. Filed May 14, 1920. Serial No. 381,326. 1 Claim. (Cl. 183—114.)



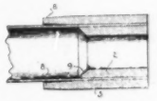
In the recovery of vapors from gases, the process which comprises supplying the gas together with a certain amount of additional vapors directly to the suction side of a pump, compressing and cooling the mixed gas and vapors, further precooling by heat transfer to cold dry tail gas, supercooling by evaporation of a portion of the liquid condensed in said various operations, returning the vapors produced in said evaporation back to the suction side of said pump and returning cold dry tail gases coming from the supercooling operation back for precooling

1,578,072. MACHINE FOR CHARGING AND DISCHARGING GAS RETORTS. THOMAS FRANCIS CANNING and RICHARD GEORGE CLARK, Southend-on-Sea, England. Filed Aug. 3, 1925. Serial No. 47,934. 8 Claims. (Cl. 214—34.)



8. In a machine for charging or discharging retorts and the like, a bar made up of a series of pivoted rigid members, an endless chain adapted for travel lengthwise the bar above and below the same, pushers carried by the chain, and means whereby the chain and bar may be moved together or the chain permitted to move relative to the bar

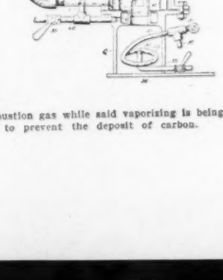
1,577,591. METHOD OF FORMING PIPE COUPLINGS AND THE LIKE. WALTER NICKLES RIZNER, Taft, Calif. Filed Dec. 16, 1922. Serial No. 607,395. 8 Claims. (Cl. 29—156.)



1 The method of making a pipe coupling, which consists in assembling an inside and an outside sleeve, which are comparatively thick, with the end of the pipe, and welding the two sleeves simultaneously to the pipe, and then swaging the same.

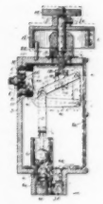
1,576,787. METHOD OF PRODUCING GAS. GEORGE L. REICHHELM, New York, N. Y., assignor to The Gasifier Company, Elizabeth, N. J., a Corporation of New Jersey. Filed Nov. 15, 1920. Serial No. 424,069. 14 Claims. (Cl. 48—212.)

4 The method of producing gas from hydrocarbon fuel consisting in vaporizing the fuel and causing a gravitational movement in a constantly changing direction, free of abrupt bends, of said vaporized fuel in and by a vehicle



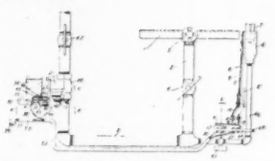
of combustion gas while said vaporizing is being accomplished to prevent the deposit of carbon.

1,581,139. THERMOSTATIC GOVERNOR FOR GAS OVENS. HOWARD WEBSTER PARTLOW, Utica, N. Y. Filed Sept. 20, 1922. Serial No. 589,375. 5 Claims. (Cl. 236—15.)



1. In combination with a burner and a valve for controlling the supply of fuel thereto, a thermostat arranged to be acted on by the heat from the burner and including a movable element, a rockable lever having a fixed fulcrum and one end disposed to be engaged and actuated by said movable element, a second lever, an adjustable fulcrum mounting the second lever between its ends for positive adjustment, a link connecting the other end of the first lever to one end of the second lever, and a second link connecting the opposite end of the second lever to the valve for controlling the same

1,582,190. SAFETY PILOT AND CUT-OFF DEVICE FOR GAS BURNERS. HARRY V PAYNE, Los Angeles, Calif., assignor to Payne Furnace and Supply Company, Los Angeles, Calif., a Corporation of California. Filed July 8, 1924. Serial No. 724,771. 3 Claims. (Cl. 67—116.)

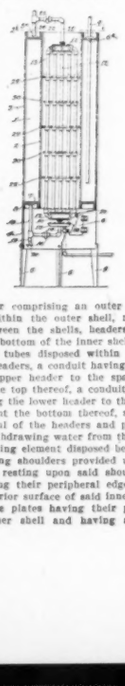


1 A safety cut-off device for gas burners comprising, in combination with a gas burner and means for supplying gas to said burner, thermally controlled means adapted to be heated by the flame at said burner and to be operated by the heat thus received, an electrical control circuit including a source of current and also including circuit-closing means normally interposing a break in said circuit, said thermally controlled means being adapted, upon movement thereof during cooling due to extinguishment of said flame, to first operate said circuit-closing means so as to close said break in the circuit and then release said circuit-closing means so as to reopen said break in the circuit, and said circuit-closing means being adapted to be operated by said thermally controlled means so as to close said break in the circuit only during movement of said thermally controlled means upon cooling thereof, electro-magnetic means also included in said control circuit, and valve means in said gas supply means and adapted to be operated under control of said electro-magnetic means so as to cut off the supply of gas to the burner when said break in the circuit is closed

1,581,441. GASEOUS FUEL. JOHN HARRIS, Cleveland, Ohio, assignor of one-half to James R. Rose, Edgeworth, Pa. Filed June 2, 1923. Serial No. 642,008. 1 Claim. (Cl. 48—3.)

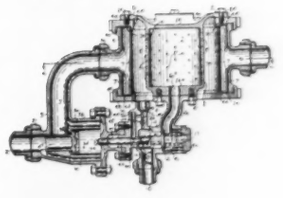
A gas especially useful for welding and cutting purposes consisting of a mixture of acetylene and ordinary coal gas in proportions of from not materially less than 10 parts to not materially more than 50 parts by volume of acetylene, to from not materially greater than 90 parts to not materially less than 50 parts by volume of such coal gas

1,582,230. GAS WATER HEATER. GEORGE O. THOMPSON, Glendale, Calif. Filed May 31, 1923. Serial No. 642,712. 1 Claim. (Cl. 122—19.)



A water heater comprising an outer shell, an inner shell disposed within the outer shell, means providing end closures between the shells, headers disposed adjacent the top and bottom of the inner shell, a plurality of straight, parallel tubes disposed within said inner shell connecting said headers, a conduit having a union therein connecting the upper header to the space between the shells adjacent the top thereof, a conduit having a union therein connecting the lower header to the space between the shells adjacent the bottom thereof, said unions providing for removal of the headers and pipes, means for supplying and withdrawing water from the space between the shells, a heating element disposed beneath the lower header, there being shoulders provided upon said pipes, and baffle plates resting upon said shoulders, alternate baffle plates having their peripheral edges in spaced relation to the interior surface of said inner shell, and the intermediate baffle plates having their peripheral edges engaging the inner shell and having apertures therethrough

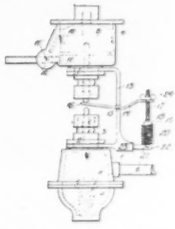
1,580,758. AUTOMATIC WATER HEATER. CHARLES W MILLS, Syracuse, N. Y. Filed Oct 25, 1922. Serial No. 596,852. 7 Claims. (Cl. 236—25.)



1 A water heater including a water chamber having inlet and outlet openings, a burner for heating the chamber, a valve for supplying gas to the burner, a pilot light for igniting the gas at the burner, a valve having movement independent of the first valve for increasing the normal feed of the gas to said light prior to actuation of said first valve, a valve for controlling the flow of water to the chamber, a by-pass structure for supplying water to the chamber while the heater is idle, means actuated by the opening of the water-control valve for successively opening the pilot light valve and the gas burner valve, and means for closing the gas-control valves and for starting the closing of the water-control valve upon stopping the flow of water through the chamber

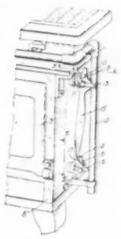
1,580,965. ADJUSTABLE CONTROL FOR GAS-VALVE OPERATING MEANS. THOMAS F CLARK, Los Angeles, Calif., assignor to Hoyt Heater Company, Los Angeles, Calif., a Corporation of California. Filed June 16, 1924. Serial No. 720,468. 4 Claims. (Cl. 236—25.)

1 In a device of the character described in combination with a gas-valve stem and a stem opposed to said gas-valve stem and operable under hydrostatic pressure, a yoke, a lever fulcrumed thereon, and means for imparting tension upon one end of said lever to cause the other end



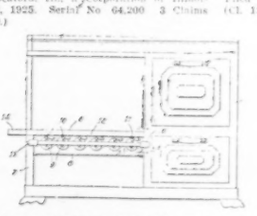
of said lever to transmit tension to said hydrostatic-pressure-operating stem, said means being adjustable outside of said yoke.

1,569,458. GAS-COCK-LOCKING DEVICE. EGBERT H CASTLE, Quincy, Ill., assignor to Comstock-Castle Stove Company, Quincy, Ill., a Corporation of Illinois. Filed Mar. 21, 1925. Serial No. 17,362. 7 Claims. (Cl. 126—42.)



1. The combination with a gas range having two burners, of a valve, valve handle, and valve handle stem for each burner, and a bar member loosely carried and supported only by one of said valve handles and one valve handle stem and movable longitudinally with respect thereto to either of two operative positions, one of said valve handles being directly engaged and locked against substantial movement by said bar when it is in one operative position, and the other handle locked when the bar is in reverse position

1,575,265. MANIFOLD SUPPORT. PETER I. HOLCHIN, Rockford, Ill., assignor to Geo. D. Roper Corporation, Rockford, Ill., a Corporation of Illinois. Filed Oct. 22, 1923. Serial No. 64,200. 3 Claims. (Cl. 126—39.)



1. In a gas stove, the combination with a burner top section of a front manifold pipe, a plurality of burner cocks for supplying gas from said manifold pipe to burners in said top section, and means for supporting said manifold pipe consisting solely of a gas supply pipe connected to and communicating with one end of said manifold pipe, and a bracket connected to and closing the opposite end thereof

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LOCATION	COMPANY	DAILY CAPACITY (M.C.F.)	TYPE OF PLANT	STATUS
Marble Lease	Pan American Petroleum Company	3,500	Comb.	Op.
Cunningham Lease	The Redondo Company		Abs.	Op.
Jaughin Lease	Sentinel Oil Company	10,000	Comb.	Op.
Marble Fee	Standard Oil Co. of California	3,260	Comb.	Op.
C. C. M. C. Lease	Torrance Gasoline & Refining Co.	12,000	Abs.	Op.
	VENTURA FIELD			
So. Mountain Lease	California Petroleum Corporation	8,000	Comp.	Op.
Calumet Lease	Calumet Oil Company	500	Comp.	Op.
Varnard Lease	General Petroleum Corp of California	10,000	Abs.	Op.
Shiells Lease	Montebello Oil Company	1,500	Abs.	Op.
Assoc.-Lloyd No. 1	Pacific Gasoline Company	17,500	Abs.	Op.
Assoc.-Lloyd No. 2	Pacific Gasoline Company	20,000	Abs.	Op.
Assoc.-Lloyd No. 3	Pacific Gasoline Company	35,000	Abs.	Op.
Gosnell	Shell Company of California	28,000	O & C Abs.	Op.
Torrey-Lee Lease	Union Oil Company of California	350	Abs.	Op.
	WHEELER RIDGE FIELD			
Kern Co. No. 2	Standard Oil Co. of California	934	Comb.	Op.

NATURAL GAS GASOLINE OPERATIONS

Compiled by J. W. MASHAW

Department of Commerce, Bureau of Mines, Division of Mineral Resources and Statistics

ONE hundred and forty-one natural-gas gasoline plants, with a daily indicated capacity of 1,125,337 thousand cubic feet, report a recovery of 31,321,073 gallons of natural-gas gasoline from 23,150,665 thousand cubic feet of gas treated, in June. This is an increase of 931 barrels in daily average production. Nineteen natural-gas gasoline plants with a daily capacity of 89,093 M.C.F. report as being shut down this month.

Utilization of natural-gas gasoline amounted to 752,583 barrels, an increase over May of 2,724 barrels. Daily average utilization of 25,086 barrels was 231 barrels more than daily average production of 24,855 barrels.

Stocks of natural-gas gasoline at the end of June amounted to 191,189 barrels, of which 25,869 barrels were reported by natural-gas gasoline plant operators and 165,320 barrels by refinery operators. This is a decrease of 6,843 barrels under May stocks. This stock figure of 191,189 barrels is approximately eight days supply at the current rate of consumption.

Production of gasoline during the month of June amounted to 3,838,975 barrels, a daily average of 127,966 barrels. This is a decrease of 413,584 barrels or 9.73 per cent under May output and 374,322 barrels or 10.8 per cent over the output of June, 1925.

Of the gasoline produced, 5,105 barrels were reported as finished gasoline produced by natural-gas gasoline plan operators. Stocks of gasoline show a decrease of 200,884 barrels during June and at the end of the month amounted to 9,861,899 barrels. This stock figure includes 463 barrels of finished gasoline reported by natural-gas gasoline plant operators.

CALIFORNIA NATURAL-GAS GASOLINE PRODUCTION, DISTRIBUTION, AND STOCKS

June, 1926

PRODUCTION

Type of Plant	*Gas Treated M Cu. Ft.*	*Natural Gas Gasoline Produced Gallons*	*Gasoline Recovery per MCF Gas Treated*
Oil Absorption	14,898,049	20,506,289	1.376 Gal.
Compressor	312,822	495,437	1.584 "
Combination Comp and Oil Absorption	3,739,248	6,006,393	1.606 "
Combination Oil and Charcoal Absorption	2,595,056	4,222,839	1.627 "
Charcoal Absorption	1,605,490	82,415	.051 "
Drip	.....	7,700	.....
TOTALS	23,150,665	31,321,073	1.353 Gal.
Finished Gasoline produced at plants			5,105 Barrels

DISTRIBUTION

Stocks first of month	.....		198,032	Bbl.
Production during month	.....		745,740	"
Quantity mixed with crude or unfinished oils	282,086	Bbl.	.....	
Used in blending at refineries	337,822	"	.....	
Stocks end of month	191,189	"	.....	
Used at Plants, Shortage and Evaporation losses	12,817	"	.....	
Balance	119,858	"	.....	
TOTALS	943,772	Bbl.	943,772	Bbl.

STOCKS

Natural-gas gasoline held by Natural Gas Gasoline Plant Operators	1,086,500	Gal.	or	25,869	Bbl.
Natural-gas gasoline held by Refiners	6,943,440	"	"	165,320	"
TOTALS	8,029,940	"	"	191,189	"
Finished Gasoline (Motor Fuel) held by Natural Gas Gasoline Plant Operators				463	Barrels

Factors *in* Prolonging *the* Life *of* Buried Pipe

(Continued from Page 68)

ALKALI EXPOSURE TESTS

3. Results of exposure tests in the very corrosive white alkali soil at Buttonwillow, California, of steel pipe specimens coated with various representative corrosion-preventing materials clearly show their relative protective values. The value of spirally-wrapped tar-saturated felt fabrics applied by machine is shown by the absence of any trace of corrosion in the exposed specimens so treated. Bituminous enamels, sometimes called "Bitumastic" coatings, display qualities of protection comparable with the wrapping. Paints as a class do not measure up to the requirements of good protection, although some protection is afforded by paint coats. This is shown by the extent of pitting in coated and uncoated specimens. Pin holes seem to be ever present in such coats on metal no matter how careful the application, although in certain types of soil good pipe paints are in the long run more economical to use than are the costly spiral wrappings. Paints with saponifiable oil vehicles such as linseed oil are definitely inferior to other types of preservative paints as proper coatings. Bakelite, paraffine, asphaltic cement, and coal tar pitch coatings, all proved faulty in the exposure test.

4. Unexpected corrosion effects are displayed in specimens of metal subjected to heat treatments and exposed in the plot of corrosive soil at Buttonwillow. Apparent opening in the seam of the butt-welded specimens used in the test is one of the more striking corrosion effects observed. That the rate of corrosion of steel in the soil is actually affected to a certain extent by heat treatment is indicated by a maximum difference in corrosion loss of 1.4 ounces per square foot of surface per year between pipes quenched from the reheating temperatures 500 degrees C. and 700 degrees C., the latter resulting in the least loss of all.

CLEANING METHODS AND CORROSION

5. An appreciable difference in the rate of soil corrosion of steel test specimens cleaned in various ways is shown at the Buttonwillow test plot. The specimen cleaned by pickling in boiling 20 per cent sulphuric acid showed a loss of 5.12 ounces per square foot per year, while a specimen cleaned by scratch brushing showed but 3.44 ounces loss, indicating that, despite the very careful neutralizing of free acid on the surface and thorough washing following treatment, traces of acid remained in the pores of the metal to stimulate corrosion.

6. Depth of burial is seemingly a factor in rate of soil corrosion. This is indicated by differences displayed in the corrosion losses of specimens put down at different depths below the ground surface at Buttonwillow: values ranging from 3.40 ounces (per square foot per year) at one-foot depth to 4.50 ounces at six feet below the surface were secured. Analyses of samples of soil taken at the several depths reveal uniform increases in the amount of comined sulphur closely following the increase in rate of corrosion, indicating that tests for the content of combined sulphur in the soil may be of some utility in predetermining its corrosive power.

MUTUAL GASOLINE CO. HAS GAS CONTRACT WITH BEACH CITY

The Mutual Gasoline Co. has made a contract with the city of Huntington Beach, Calif., which gives that company the right to lay pipe lines to handle the natural gas from wells that may be completed on the recently opened up western part of the city.

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Study *of* Fuel Problems *in* Western Gas Making

(*Continued from Page* 48)

In considering gas-making processes in which so-called *valuable* liquid by-products are recovered, it should be remembered that manufactured gas is sold at a higher price per B.t.u. than any of the crude or semi-refined by-products. Usually it costs less to deliver the gas than to refine or prepare for market and deliver the by-products.

CONSIDERATIONS OF OIL SAVING

In making 550 B.t.u. city gas, the oil requirements of the oil-gas and carburetted water-gas processes are, respectively, about 8 gallons and 3.3 gallons per thousand cubic feet of gas. In view of what we believe to be the "oil situation" this fact alone is sufficient to warrant gas companies giving careful consideration, if not preference, to the latter process in the construction program for the immediate future.

Oil is gasified in the carburetion of water gas with a higher thermal gasification efficiency than in the oil-gas process. The heat units in 550 B.t.u. carburetted water gas contributed by the carburetting oil is approximately 100,000 B.t.u. per gallon of oil, whereas with 550 B.t.u. oil gas each gallon of oil contributes only 68,750 B.t.u.—allowing 8 gallons as the total oil used per M cubic feet of oil gas. This is another reason why the gas industry should look with favor upon the carburetted water-gas process, which is in harmony with conservation principles.

In making mixed water gas and oil gas, or mixed gas containing water gas and oil gas, it is possible to crack the oil used in making the oil-gas portion with higher efficiency than is now common practice. In other words, some of the well-founded reasons now prevailing for not making richer oil gas will no longer apply as they do in making and distributing straight oil gas.

Manufactured gas (carburetted water gas or mixed gas) need not cost appreciably more, if any more,—even under prevailing conditions,—in the northern gas-producing centers of California than the cost of oil gas of the same heating value, with sized coal at $7.50 a ton delivered.

PURIFICATION IS PROBLEM

Unless a cheap means is discovered for removing the sulphur from high-sulphur crude oils or from gas-oils, it will be necessary to use oils containing a high per cent of sulphur in the manufacture of gas in California. To successfully use such oil it will be necessary to provide means for purifying the resulting gas, which will contain a troublesome amount of H_2S and organic sulphur. Whether the present process of liquid purification can be developed to purify this gas, or whether it will be necessary to develop a modified method, must be determined by research. An appreciable amount of the oil available in California—some of which is not being won at present—is high-sulphur oil. Also, much of the oil-shale of California will yield oil high in sulphur, judging from the limited work done in this field.

The solution of the purification problem will simultaneously make available for gas-making purposes the highest grade coal found in California—namely, the Monterey County coal, which contains too much sulphur for this use under present conditions.

Efficient operation of water-gas sets using bituminous coal is dependent upon the use of clean, screened coal in the generator. The best results will naturally be obtained with a coal which is not friable and does not dis-

integrate upon being heated. An attempt should be made, through a scientific study of generator design and fuels, to develop a generator in which other fuels can be gasified with equal efficiency.

SOUTHERN CALIFORNIA SITUATION

In the southern part of California, natural gas will probably be used as an enricher of water gas when the supply is less plentiful; and it seems that, as the supply of natural gas decreases, the methods of operating the water-gas sets to produce gas most economically will vary. A scheme of operating procedure can be and should be worked out for each particular set of conditions. Attention is called to the possibilities in operating with a prolonged blow-run making mixed gas containing water gas, blow-run gas, and natural gas. To a certain extent the results with varying operating methods can be computed; but economic conditions, as well as the particular properties of the most available coal, enter into the problem, and it appears that a series of tests operating on commercial-size equipment with available coals would be a profitable investment at the present time. So far as the writer is aware, this method of producing mixed gas has never been attempted.

A similar result may be obtained by making an extended steam run of from 5 to 20 minutes, admitting a controlled amount of air during the steam run, and admixing the resulting gas with natural gas—adjusting the cycle and quantity of air admitted per M of generated gas according to the available supply of natural gas, etc. An interesting series of experiments of this general character could be made at moderate cost, the gas produced thereby being mixed with the main gas supply.

Assuming that oil will be used in the future as a gas-enriching agent for manufactured gas rather than as the sole raw material, and realizing that under such conditions oil can be gasified more efficiently than in the oil-gas process, some thought might be given to the possibility of using the present oil-gas generating equipment in producing a very much richer gas for use as a carburetting material.

SHALE OIL POSSIBILITIES

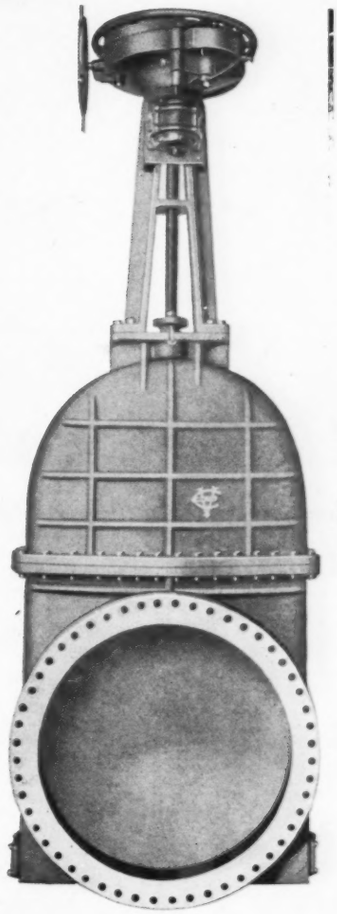
Anticipating the necessity or future desirability of using shale-oil as a gas-enriching material, small-scale cracking experiments probably would give some information which would be useful. The results will probably vary widely according to method of producing the oil; hence this factor must be correlated with the results of cracking tests. The relative values of California gas-oil and oil resulting from the distillation of the so-called oil-shale of California will then be better understood.

A study should be made of the possibilities of using petroleum carbon (coke) such as is produced in California by the most approved methods of refining oil in the gas-making process. This study should be accompanied by laboratory experiments. The results of a brief examination of Dubbs-still coke given in this report show the value of such fuel with respect to calorific value, sulphur content, and the nature and quantity of volatile matter. What is the best means of utilizing this fuel most effectively in the generation of gas? So far as the needs of the immediate future are concerned, the answer may be different for the different gas-distributing centers.

PRESIDENT OF PANAMA-COLON GAS COMPANY DIES

Charles J. Clark, president of the Panama-Colon Gas Company, died suddenly in Philadelphia, late in June.

CHAPMAN VALVES



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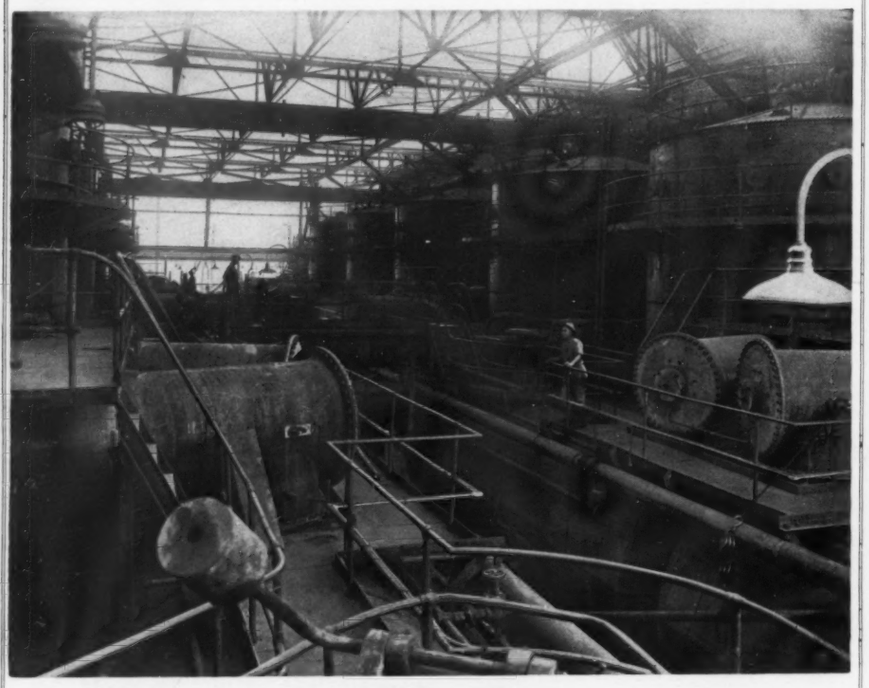

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GAS COMPANY UTILIZES PREMIUM CONTEST IN PANAMA

Increasing the use of gas appliances through the medium of a premium contest, in which the awards are various kinds of gas burning equipment, is the latest new business departure of Paul Vecker, general manager of the Panama-Colon Gas Company, serving gas in the Panama Canal Zone. The contest was a tie-in with the British-American Tobacco Company, providing for the awarding of prizes for empty cigarette packages.

GAS WELL FLOWS OIL, THEN WATER, BUT GAS FLOW REMAINS

A gas well belonging to the Thermopolis (Wyo) Gas Company in the Little Grass Creek Field west of that community has been going through some internal gymnastics lately. A small flow of oil came over the top of the casing soon after the well, which had been closed down, was reopened. This oil flow ceased and gave place to a water flow, with the gas flow remaining unimpaired.

STATE GEOLOGIST OF IDAHO HAS BULLETIN ON TETON SURVEY

Virgil Kirkham, state geologist of Idaho, connected with the University of Idaho, has prepared a bulletin following a survey of the Teton County region. At least one well in that section, that of the Teton County Oil Co., near Driggs, is making considerable gas.

TELEPHONE REMINDER CARDS INSPIRE TO COURTESY

The use of telephone reminder cards is proving very helpful to the Portland Gas & Coke Company in improving telephone service. The cards, which carry courtesy messages to employees, are hung over the mouthpiece of the telephones and are changed from time to time.

DESCRIPTIVE CIRCULAR OUT FOR LEE B. METTLER CO.

A new circular describing the Lee B. Mettler Company's No. 6 and No. 12 special burners has been issued. The burners, built to operate either on low or high pressure gas, are designed for heating installations and small industrial furnaces.

CHARLES HARRIS TO PROMOTE DUNN SALES ORGANIZATION

The Dunn Painting Machine Company of San Francisco announces that Charles W. Harris of that city will organize a sales force, headquarters of which will be located at the Dettner Building, 835 Howard St., San Francisco.

JIM REED AT MT. VERNON HOME OF COOPER COMPANY

Jim Reed, western manager for the C. & G. Cooper Company of Mt. Vernon, Ohio, left in July on a trip to headquarters, but plans his return in time for the P.C.G.A. Convention at Pasadena, August 23-27.

HANDBOOK PREPARED FOR MEN OF PACIFIC GASOLINE CO.

A handbook has recently been prepared for the employees of the Pacific Gasoline Company, being devoted to the various phases of the company's operations.

A. P. I. TO MEET IN TULSA IN CONVENTION, DEC. 7, 8, 9

December 7, 8, 9 are the dates of the annual convention of the American Petroluem Institute this year. Hotel Mayo, Tulsa, Oklahoma, is convention headquarters.

A. F. Rice

A. F. Rice *with* Basford Co. *in* San Francisco

A. F. Rice, formerly general manager of the Western Stove Company of Culver City, Calif., on July 1 took up new duties with the H. R. Basford Company of San Francisco. His many friends of Southern California wish him well in his new association. The report published in our July issue, to the effect that H. R. Basford, president of the H. R. Basford Company, had announced his retirement from active management of the company was in error. Word from the company says that Mr. Basford "will probably die in service with his boots on," which, after all, is to be expected from a long-time leader in western gas appliance merchandising.

P. G. AND E. BUYS GAS SYSTEM AT SANTA CLARA

For a consideration reported at $50,000 the Pacific Gas and Electric Company became owner of the municipal gas system of Santa Clara, Calif., by action of the town trustees at a meeting held July 20. The town has been buying its gas from the P. G. & E. for two years.

WASHOMA PETROLEUM COMPANY MAY SERVE MONTESANO

By action of the city council of Montesano, Wash., the Washoma Petroleum Company was granted a franchise to serve that community with natural gas for 35 years, upon acceptance of the franchise within 60 days.

MURRAY WITH OKLAHOMA CONTRACTING COMPANY

Charles J. Murray has recently resigned from staff of The Linde Air Products Company, to become associated with the Oklahoma Contracting Company. He is now organizing a new division of that concern to engage exclusively in oxwelded pipe line construction. During his association with the Linde Company Mr. Murray specialized in this class of work and has studied the construction problems connected with a large number of notable trunk line projects.

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Corrosion, the destructive and costly enemy of your pipe lines, is effectively balked by the thick protective coating made by one application of Eclipse Save-A-Line to the pipe surface.

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A Few of the Larger Users of Save-A-Line

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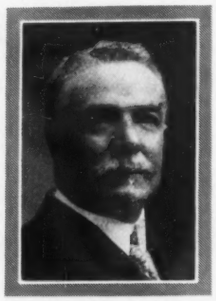
Sale *of* Gas *for* Heating Pushed *in* Victoria

THE sale of manufactured gas for heating is actively pushed in Victoria, B. C., by the British Columbia Electric Railway Co., Ltd. Minimum costs of manufacture, attained through efficient plant design, are the first essential in enabling gas to enter the heating field with any hope of economic success, says Fred H. Hewlings, superintendent of the company's gas department.



F. H Hewlings

In a statement to *Western Gas,* Mr. Hewlings further outlines his company's stand on the heating question as follows:

"The policy of our gas department is to push the sale of manufactured gas for heating in competition with coal, wood and oil, in which operating costs have to be seriously considered, and to meet this condition our company has scheduled rates as low as 75c to 60c per thousand cubic feet, quite a difference in price as compared with the old illuminating days with gas selling locally for $5.00 per thousand cubic feet. Notwithstanding this radical change in the trend of the manufactured gas business, i. e., from illumination to heating, the writer has seen the local gas output increase over tenfold, and is of the opinion that we have just placed our feet upon the threshold of the door opening up to our view the immense possibilities incidental to the proper uses of manufactured gas as an aid to mankind in his everlasting search for comfort and happiness."

Mr. Hewlings has been in charge of the manufacture, distribution and sale of gas in Victoria since 1886, at first with the original owners of the Victoria Gas Co., Ltd., selling gas for illuminating purposes only, with the gas made from local coals carbonized in small horizontal retorts. Then with the change in ownership to the British Columbia Electric Railway Co., Ltd., the manufacture and sale of gas for its heating values have been stressed, with coal gas now being made in continuous vertical retorts with waste heat boilers, spiral guided holder storage, and other features of approved plant design.

L. J. WILLIEN GAS ENGINEER FOR BYLLESBY INTERESTS

W. W. Fuller, vice-president of the Byllesby Engineering and Management Corp., in charge of engineering and construction, has announced the appointment of L. J. Willien as gas engineer of the corporation.

DECREASE IN OIL USED FOR ELECTRICITY GENERATION

Figures compiled by the U. S. Geological Survey show a decrease of 38 per cent in the amount of oil used for generation of electricity in 1925 as compared with 1924. Gas burned for the same purpose decreased four per cent, and the amount of coal consumed in producing electricity increased seven per cent. Coal represented nearly 90 per cent of the fuel of electric power plants, although 50 billion cubic feet of gas and 10 million barrels of oil were burned in addition.

The Annual Convention

(Continued from Page 46)

a fitting conclusion to a Convention *par excellence*.

Of particular interest to ladies are the following events:

MONDAY, AUGUST 23

4:00 P. M.—Tea, Lawn, Hotel Vista del Arroyo.
8:00 P. M.—Moving Picture, Dancing.

TUESDAY, AUGUST 24

9:30 A. M.—Drive through Pasadena, Oak Knoll, Altadena and Flintridge, with visit to Busch Gardens, returning to Hotel at 12 o'clock.
1:00 P. M.—Luncheon and Bridge Party, Annandale Golf Club. (Cars will leave Hotel at 12:50 P. M.)
8:00 P. M.—Theatre Party or Dancing.

WEDNESDAY, AUGUST 25

7:45 A. M.—Trip to Catalina. Busses will leave Hotel at 7:45 A. M.
Luncheon at St. Catherine Hotel.
Glass-bottom Boat Trip.
Return to Hotel, 7:30.
Dinner at Hotel.

THURSDAY, AUGUST 26

9:30 A. M.—Ladies' Golf Tournament, Flintridge Country Club.
Swimming, Flintridge Country Club. For Ladies who do not wish to participate in the Golf Tournament or Swimming, cars will be provided to take them to shops or on short trips. Ladies going to Flintridge Country Club will be served luncheon there.
1:30 P. M.—Scenic Trip to Mt. Lowe.
Busses will leave Flintridge Country Club at 1:30, connecting with car line. Busses will also leave Hotel at 1:30, connecting with same car.
9:00 P. M.—Formal Ball.

FRIDAY, AUGUST 27

10:00 A. M.—Swimming and Luncheon, Club Casa del Mar, Santa Monica. (Cars will leave Hotel at 10:00 A. M.)
7:00 P. M.—Annual Banquet.

Everyone Convention-bound — and there should be an unprecedented number this year—is urged to arrange his plans to arrive the morning of August 23, leaving the train at Glendale where automobiles will be in waiting to supply transportation to the Hotel. Baggage should be checked to Glendale.

ROYALITE NO. 4, IN TURNER VALLEY IS BIG PRODUCER

During the year ended May 31, 1926, Royalite No. 4 well in the Turner Valley of Alberta produced 184,482 barrels of 73 Baume grvaity naphtha, the highest grade of natural gas gasoline. This well is also producing about 18,000,000 cubic feet of gas daily.

JENSEN INSTRUMENT CO. IN NEW QUARTERS

The Jensen Instrument Company has moved to 443 So. San Pedro St., Los Angeles, Calif. In addition to the engineering and service carried on in the past three years, the company has secured exclusive sales agencies in Southern California for Lewis M. Ellison and for all California and Arizona for Charles Engelhard, Inc., A. E. Moeller Co., Locke Regulator Co., Union Water Meter Co., and Star Brass Manufacturing Co. (Valves). They also have a special independent sales and service arrangement with the Foxboro Co., Inc. for all California and Arizona.

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Krodeproof renders steel tanks or underground pipe immune to weather or soil conditions.

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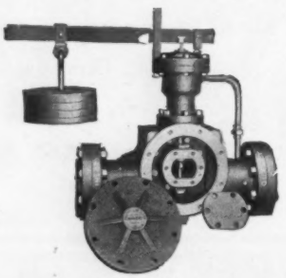

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Stocks Carried in Los Angeles

A Gas Man's Business

(Continued from Page 45)

thing that interferes with reason is bound to interfere with results.

On the other hand, an organization of many partakes of a definite law of averages. It will make fewer mistakes and be on the job more effectively. United efforts by separate units, towards a common end, usually result in achievement.

As an example, let us glance at a page in the great book of nature. The mighty sun,—the biggest unit in our planetary system of unending space,—finds time and opportunity, from the far reaches of her sky-high throne, to lend a helping hand in raising on high the dewdrops of early morning. The overhanging clouds below are ready and anxious to marshal them in order, and the four great winds lend willing shoulders to carry those clouds from the ends of the earth to wide stretching watersheds of the high hill country. There these little and comparatively insignificant dewdrops, falling as drops of rain, begin their useful career in sharing a work that the separate elements,—powerful as they are,—find an impossible task. And it is these little dewdrops that make possible the runnels, the rills, the brooks, and the streamlets, which in turn develop the mighty Mississippi. And it is only as the *greater* forces in nature contribute a power to bring the *lesser* into action, that navigation becomes possible and the further along we go, the deeper, the wider the current, and the greater the traffic it can bear. The moral? Come thou, oh, leader of the gas industry—who hast heretofore turned a deaf ear to the clarion call of duty—come and do likewise. And again I say, come!

PAINT MANUFACTURERS BUILD ADDITION AT VAN NUYS

The Everlasting Paint and Sales Company, 704 Sun Finance Building, Los Angeles, is increasing its plant capacity at Van Nuys, Calif., by additions of building and machinery equipment aggregating about $50,000 in cost, according to A. M. Shenk, sales manager of the firm. The company manufactures a protective coating for distribution under the trade name of "McEverlast."

SAN JUAN GAS YIELD NOW AT 160,000,000 CU. FT.

Approximately 160,000,000 cu. ft. of natural gas is reported being produced each day by the wells in the San Juan field, which lies in the southern part of Colorado and Utah and the northern part of New Mexico. The gas is said to yield several gallons of natural gasoline to the thousand cubic feet.

RECORD PETROLEUM STRIKES 20,000,000 CU. FT. FLOW

The Record Petroleum Company, drilling on the Albrecht lease in the Montana Big Lake field, struck what is estimated at a 20,000,000 cu. ft. gas flow on July 9. Gas produced by this well will be used by the United Carbon Company at its plant now being erected at Jacobus, Montana.

NEWTON PROCESS MFG. COMPANY ADDS TO FULLERTON PLANT

A $50,000 addition has been made to the Fullerton, Calif., plant of the Newton Process Manufacturing Company, the new building covering an area of 100 by 180 feet, of steel construction throughout.

Clow "Gasteam" Radiation

A Unit System of Cast Iron Steam Radiators—Using Gas for Fuel

Passed by the Highest National Authority with a Rating of *Absolute Zero* on Monoxide Test. The Only "Gasteam" Radiator Included in the Published "List of Inspected Mechanical Appliances" of the National Board of Fire Underwriters.

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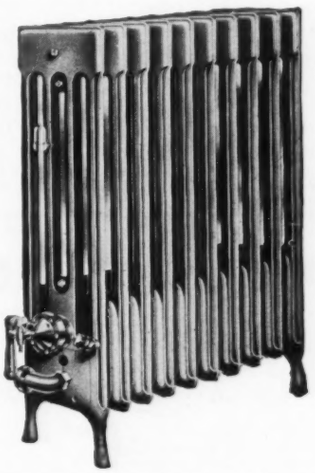

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THIS Governor automatically feeds gas to the boiler furnace in such quantity as to maintain a constant given steam pressure under varying conditions of load.

It consists of a set of valves opened by a weighted lever and closed by the steam pressure of the boiler, thus admitting or shutting off the gas as the demand for steam on the boiler varies. It will maintain a constant and unvarying pressure of steam from 1 to 150 pounds or more, automatically, no matter how frequently or how greatly the demand for steam varies. Write for our catalogue.

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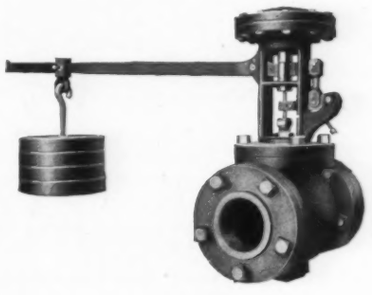

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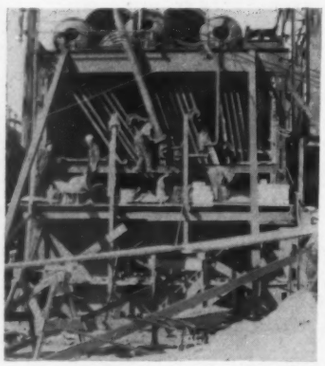

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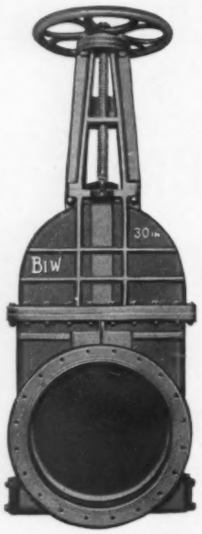

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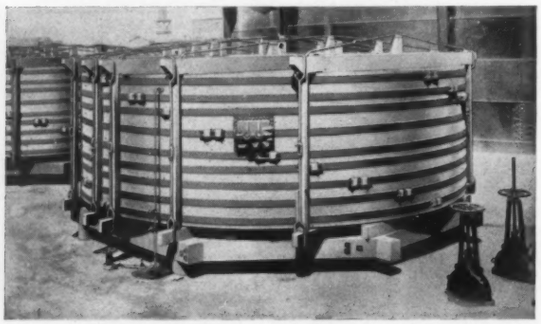

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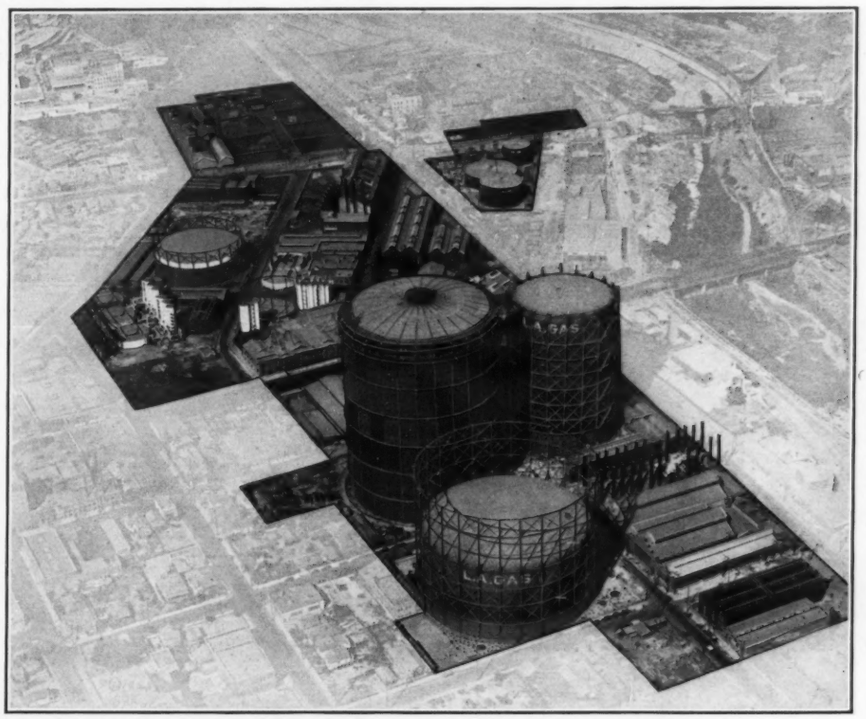

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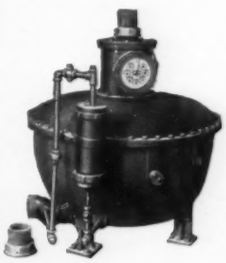

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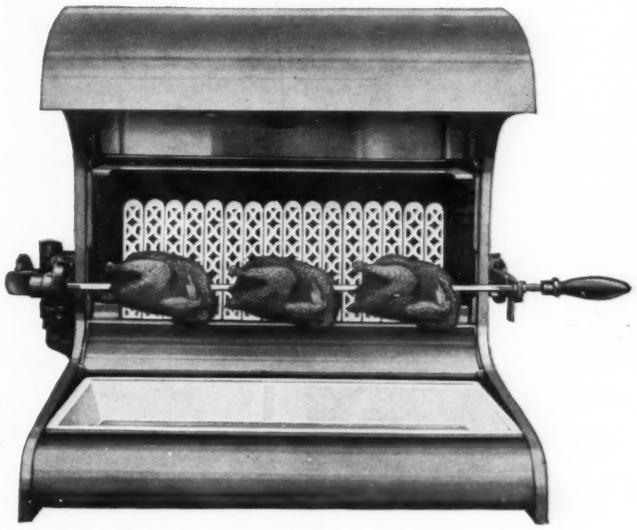

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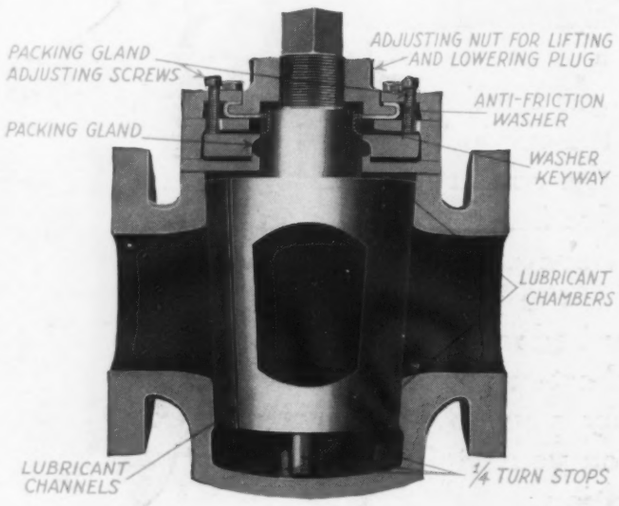

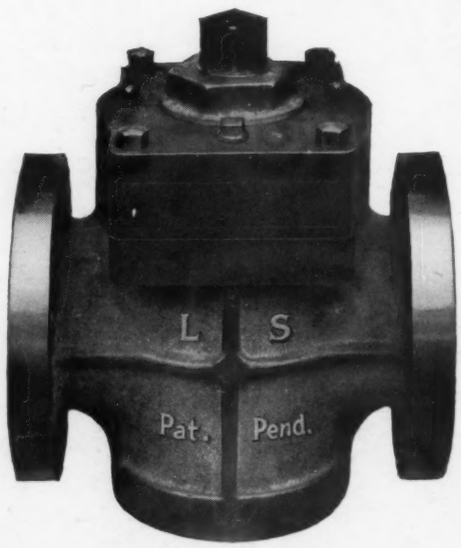

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